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"South London School of Pharmacy, 31st October, 1873.

"Messrs. Southall, Son, and Dymond,

"Dear Sirs,—I have great pleasure in expressing the satisfaction which the specimens you provided for our Museum have given, and I also am always happy to say a word in favour of your excellent and economical Student's Collection, which I invariably recommend for the use of country Students. "Yours, faithfully, "JOHN MUTER."

*The following is from* DR. P. W. LATHAM, *Deputy for the Dowing Professor of Medicine, Cambridge University.*

"Cambridge, February 25th, 1869.

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"In my lectures on Materia Medica, I have shown my class your 'Student's Collection,' and strongly recommend each member to purchase one.

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"So far as we have been able to examine the collection, the specimens appear to have been very carefully selected, and well adapted for the purposes of which they are intended. We believe that this collection, which may be purchased at the moderate price of twenty-five shillings, will prove a real boon to students, more particularly at the present time, and especially to those who live beyond the reach of places where facilities for study are afforded."—*Pharmaceutical Journal.*

"In our last number we stated that Messrs. Southall, Son, and Dymond, of Birmingham, had issued a collection of specimens of the Roots, Barks, Flowers, Fruits, Leaves, Resins, Gums, &c., of the British Pharmacopœia, to assist Students in preparing for the Minor and Modified Examinations of the Pharmaceutical Society. Taking the high character of the Firm into consideration, we did not hesitate to recommend this collection before examining it; but we confess that our idea of its nature and extent was so far too narrow. The price at which it was offered led us to expect a much poorer display of the Materia Medica of a Student's Collection. The specimens, which have evidently been most carefully selected, are packed in a large deal box. The quantities given represent a value which cannot fall short of the price demanded for the entire collection. Chemists and Druggists in business, as well as the Student, will thank Messrs. Southall, Son, and Dymond for supplying such an admirable collection of characteristic specimens of drugs at such a low price."—*Chemist and Druggist. November*, 1868.

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# SOUTHALL, SON & DYMOND,

## MANUFACTURING PHARMACEUTICAL CHEMISTS, BIRMINGHAM.

# A KEY

TO

# ORGANIC MATERIA MEDICA.

ADAPTED FOR USE

IN THE

**Museum of the South London School of Pharmacy,**

COMPILED FOR THE STUDENTS,

BY


## DR. JOHN MUTER, F.C.S.,

DIRECTOR.



LONDON:

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# PREFACE.

THE ensuing pages are intended as Short Notes and Memoranda, to remind the Student of the salient points about each Article as he handles and examines it in the Museum. When destitute of such a Guide, a Student is often apt to spend hours in a Collection, and yet come away very little the wiser. The Book is not published as a "cram," nor will it, I fancy, be found to answer that purpose, but simply as a means of ready reference during what is really a Pharmaceutical "object lesson." I have to acknowledge the assistance of our Materia Medica Demonstrator, Mr. TWIST, in tabulating and aiding greatly in the correctness of the Book as a Key to our Museum.

J. M.

South London School of Pharmacy,
325, Kennington Road,
24th September, 1873.

# A KEY

TO

# ORGANIC MATERIA MEDICA.

## CLASSIFICATION OF PLANTS.

SUB-KINGDOM. 1. — PHANEROGAMIA. — Plants having flowers and propagated by seeds having a visible embryo.

**Class 1.—Dicotyledones.**—Plants having two cotyledons; germination exorhizal; stem exogenous; leaves reticulated; parts of the flower arranged in "fours" or "fives."

**Division I.**—*Angiospermia*, having their ovules enclosed in an ovary, and impregnated by the pollen through a stigma. This division embraces four sub-classes, as follows:—

(1.) *Thalamifloræ.*—Usually dichlamydeous, with the corolla polypetalous arising from the thalamus; stamens usually hypogynous, or adhering to the sides of the ovary.

(2.) *Calyciflorœ.*—Usually dichlamydeous, with the corolla polypetalous inserted on the calyx; stamens perigynous or epigynous.

(3.) *Corolliflorœ*—Corolla monopetalous: Stamens epipetalous, or sometimes arising from the thalamus or inserted on the ovary.

(4.) *Apetalæ*, or *Monochlamydeæ.*—Flowers either monochlamydeous or Achlamydeous.

**Division II.**—*Gymnospermia.*—Plants having naked ovules which are impregnated by the direct action of the Pollen.

**Class II.**—*Monocotyledones.*—Plants having only one cotyledon; germination endorhizal; stem endogenous; leaves with usually parallel veins; parts of flower arranged in "threes." There are not any divisions of this class, but only three sub-classes, as follows :—

(1.) *Dictyogenæ.*—Leaves reticulated and deciduous; root and rhizome with wood in rings; floral envelopes whorled.

(2.) *Petaloidæ.*—Leaves parallel in venation; perianth usually coloured and verticillate, rarely absent.

(3.) *Glumaceæ.*—Leaves parallel; flowers destitute of perianth, but enclosed in bracts, called glumes and paleæ.

**Sub-Kingdom II.**—*Cryptogamia,* or flowerless plants, all classed as

*Actoyledones.*—Plants propagated by spores instead of seeds, and consequently have no cotyledons; germination heterorhizal; stems, when present, acrogenous; leaves, when present, with furcate venation; no flowers, but collection of spores in spore cases. There are two sub-classes.

(1.) *Acrogens,* which have a distinction of leaf and stem, and also stomata.

(2.) *Thallogens,* which have no distinction of leaf and stem, and no stomata.

TABULAR VIEW OF THE MEDICINAL NATURAL ORDERS, SHOWING THE SUB-CLASSES TO WHICH THEY RESPECTIVELY BELONG.

| Thalamifloræ. | Calycifloræ. | Corollifloræ. | Apetalæ. | Dictyogenæ | Petaloidæ. | Glumaceæ. |
|---|---|---|---|---|---|---|
| Ranunculaceæ. | Rhamnaceæ. | Caprifoliaceæ. | Polygonaceæ. | Smilaceæ | Zingiberaceæ | Graminaceæ. |
| Menispermaceæ. | Anacardiaceæ. | Cinchonaceæ. | Thymelaceæ. | | Marantaceæ. | |
| Papaveraceæ. | Amyridaceæ. | Compositæ. | Myristicaceæ. | | Iridaceæ. | |
| Cruciferæ. | Leguminosæ. | Valerianaceæ. | Lauraceæ. | | Liliaceæ. | Acrogens. |
| Polygalaceæ. | Rosaceæ. | Lobeliaceæ. | Euphorbiaceæ. | | Melanthaceæ | |
| Malvaceæ. | Myrtaceæ. | Ericaceæ. | Piperaceæ. | | Palmaceæ. | Filices. |
| Byttneriaceæ. | Cucurbitaceæ. | Styracaceæ. | Cannabinaceæ. | | | |
| Aurantiaceæ. | Umbelliferæ. | Oleaceæ. | Cupuliferæ. | | | |
| Canellaceæ. | | Asclepiadaceæ. | Liquidambaraceæ. | | | Thallogens. |
| Guttiferæ. | | Loganiaceæ. | | | | |
| Rutaceæ. | | Gentianaceæ. | | | | Lichenes. |
| Zygophyllaceæ. | | Convolvulaceæ. | | | | Fungi. |
| Simarubaceæ. | | Solanaceæ. | Gymnospermia. | | | Algæ. |
| | | Atropaceæ. | | | | |
| | | Labiatæ. | | | | |
| | | Scrophulariaceæ. | Coniferæ. | | | |

TABULAR VIEW OF THE MEDICINAL NATURAL ORDERS, SHOWING THE SUB-CLASSES TO WHICH THEY RESPECTIVELY BELONG.

| Thalamifloræ. | Calycifloræ. | Corollifloræ. | Apetalæ. | Dictyogenæ | Petaloidæ. | Glumaceæ. |
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| Papaveraceæ. | Amyridaceæ. | Compositæ. | Myristicaceæ. | | Iridaceæ. | |
| Cruciferæ. | Leguminosæ. | Valerianaceæ. | Lauraceæ. | | Liliaceæ. | Acrogens. |
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| Malvaceæ. | Myrtaceæ. | Ericaceæ. | Piperaceæ. | | Palmaceæ. | Filices. |
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| Aurantiaceæ. | Umbelliferæ. | Oleaceæ. | Cupuliferæ. | | | |
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| Simarubaceæ. | | Solanaceæ. | Gymnospermia. | | | Algæ. |
| | | Atropaceæ. | | | | |
| | | Labiatæ. | | | | |
| | | Scrophulariaceæ. | Coniferæ. | | | |

**Resins**—Are solid and brittle bodies which are also found in plants, together with volatile oils. They are, however, not volatile like *stearoptens*, and are mostly soluble in alcohol or oil of turpentine.

**Gums**—Are brittle bodies, usually inodorous, and entirely soluble in water, and insoluble in alcohol.

**Gum-resins**—Are mixtures of gum and resin, and therefore partly soluble in water and partly in alcohol. When rubbed with water, the gummy portion is often sufficient to form a mucilaginous liquid, which suspends the resinous portion in the form of an emulsion.

**Oleo-resins**—Are mixtures of a volatile oil with a resin. They are soft and oily, but thicken by exposure to the air.

**Balsams**—Are bodies which partake of the physical appearance of oleo-resins, but which are characterized by containing Cinnamic or Benzoic acids. When the former, they yield by oxidation *Benzoic Aldehyde* (oil of bitter almonds.)

**Colouring Matters**—Are bodies which possess the property of absorbing all the constituent colours of a ray of light, except one, which is reflected to our eyes, and so produces the idea that the substance possesses a particular colour. Sometimes a combination of coloured rays are so reflected, thus producing great variety of tints. If a ray of light were not made up of many such coloured rays, all objects would be colourless.

**Starch**—Is a white, granular, transitory body, stored up in plants for their nourishment. Before absorption, it is turned into dextrin and sugar.

**Sugar**—Is a compound of carbon, hydrogen, and oxygen, soluble in water, and being capable of producing

alcohol when fermented with yeast. There are two great varieties found in plants, viz., glucose or grape sugar, and sucrose or cane sugar. The former is the common variety, and is blackened by heating with potash, while the latter is not affected by that alkali, but blackened by warm dilute sulphuric acid.

**Albuminous Matters**—Are neutral substances containing nitrogen, which constitute the "*flesh forming*" portion of edible plants, in contradistinction to the other constituents which are not nitrogenous, and only act as "*heat producers*" on the animal economy. *Vegetable Albumen* is soluble in water, and coagulates on boiling, like white of egg. *Gluten* is an insoluble albuminous matter, in which the graminaceæ are particularly rich, while *Legumin* is an albuminous matter found in many seeds, soluble in slightly warm water, and precipitable by the addition of a few drops of acetic acid.

**Chlorophyll**—Is the green colouring matter of plants. It contains carbon, hydrogen, nitrogen, and oxygen. It is insoluble in water, but soluble in alcohol and ether. It is supposed to consist of a blue portion called Phyllocyanin, and a yellow part called Phylloxanthin. It is only developed under the influence of light. Plants, the stems of which are covered with earth, develop no Chlorophyll in the covered portion (a good example of this is seen in the stalks of celery as grown for the table). It is separated from expressed vegetable juices by heating to 130 degrees and filtering it out. A higher temperature must be avoided, as the Chlorophyll, when heated above 130 degrees, becomes brown.

**Raphides**—Are clusters of crystals, usually oxalates or phosphates, deposited in the tissues of plants. They are specially visible in the Polygonaceæ.

**Inspissated Juices**—Are soft substances produced by allowing the fluids which exude from a plant to thicken by the spontaneous evaporation of their moisture.

**Extractive Matters.**—This is a general name applied to colouring and other substances, the composition of which has not been definitely studied or ascertained.

**Isomeric Bodies**—Are substances which are alike in the percentage amounts of their constituent elements, but differ in physical characters.

**Analagous**—Is a general term employed to intimate that one substance is very similar to another, but with a difference which is either beyond the province of the present pages to explain, or which has not been accurately ascertained.

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## DRAWER A.

### FRUITS.

**No. 1.**—Also Case B. 45.—**Nux Vomica Seeds.**—The seeds of Strychnos Nux Vomica. *Loganiaceæ.* Imported from Coromandel, Ceylon, and other parts of India. The fruit is a berry filled with a pulpy substance, in which the seeds (peltate in shape, and covered with short satiny hairs) are immersed. The point rising from the concave surface is the *hilum,* that on the margin is the *chalaza.* The line (not very well marked) running from the *chalaza* to the *hilum,* forms the *raphe.* The hairy coat forms the *testa.*

**Composition.**—Two Alkaloids Strychnia and Brucia, in combination with Igasuric Acid. (1.) Strychnia $C_{21}H_{22}N_2O_2$, is very slightly soluble in water (giving a bitter taste to 40,000 parts of water), but more soluble in boiling rectified spirits and chloroform. *Tests.* — Not

coloured by Nitric or Sulphuric Acids (showing absence of Brucia, &c.) and burns without residue. Treated with Potassium Bichromate, and Sulphuric Acid, it gives a *violet* colour, very beautiful, but evanescent. (2.) Brucia $C_{23}H_{26}N_2O_4$ 4 $H_2O$, is slightly soluble in water, but more so than strychnine, and readily soluble in alcohol. *Test.*—Turns *blood-red* with Nitric Acid, which is then changed to *violet* or *green* by Stannous Chloride or reducing agents. This distinguishes it from Morphia, which is also *reddened* by Nitric Acid, but the colour is quite *bleached* by reducing agents. Brucia is considered to be $\frac{1}{20}$ the strength of Strychnine. Dose to 2 grains.

**Properties.**—Strychnia is a very powerful poison; $\frac{3}{4}$ of a grain has been known to cause death. It is a nervous stimulant. Dose, $\frac{1}{30}$ to $\frac{1}{12}$ of a grain.

**Administration.**—(1.) If in the form of pills, sugar of milk should be made the means of division. Antidotes.—No chemical antidote known. Proceed by emptying the stomach by emetics, give astringents and narcotics. (Tobacco, and recently, Chloral Hydrate have been recommended.)

Preparations of Nux Vomica:—

Extractum Nucis Vom. 1*lb.* seeds yield $1\frac{1}{2}$ oz. extract. Dose, $\frac{1}{2}$ to 2 grains.

Tinct. Nucis Vom. 1 gr. in 11 minims. Dose, 10 to 20 minims.

Preparations of Strychnia:—

Liquor Strychniæ, $\frac{1}{2}$ gr. in 1 drachm. Dose, 5 to 10 minims.

**No. 1. — A. — St. Ignatius Beans.**—(Non official owing to rarity.) The seeds of Strychnos Ignatia. *Loganiaceæ.* Imported from the Phillipine Islands. These are substituted for the Nux Vomica Seeds, but may be known from the latter by their shape.

**Composition,** same constituents as Nux Vomica, and yields about 1·2 per cent. of Strychnine.

**No. 2.**—Case B. 52.—**Croton Seeds.**—The seeds of Croton Tiglium. *Euphorbiaceæ.* Imported from Ceylon. Distinguished from Castor Oil Seeds by size and appearance. Part used is the oil obtained by submitting the seeds to pressure, when they yield from 50 to 60 per cent.

**Composition,** a volatile oily acid (*Crotonic Acid*) inactive, and a fixed oil, soluble in Ether and volatile oils. Test. *Reddens* litmus paper. Agitated with one volume of alcohol and gently heated it forms a clear solution, from which three-fourths of the oil separates on cooling. This is not at all times reliable.

**Properties.**—Drastic purgative, used in obstinate constipation, and in small doses as a general purge. Applied to the skin it produces pustules. When dropped upon the tongue it causes a burning sensation in the throat. Dose, ½ to 1 minim.

**Administration.**—Made into pill with bread crumbs or cacao butter.

**Preparation.**—Linimentum Crotonis, 1 in 8.

*Antidotes.*—Emetics (as 10 grs. Zinci Sulph.) Mucilaginous drinks and opium to check the action of the bowels.

**No. 3.**—Case B. 49.—**Cocculus Indicus,** commonly called the Levant Nut (non official.) The fruit of Anamirta Cocculus. *Menispermaceæ.* Imported from the coast of Malabar. The Student will observe its shape, and also that the seed is attached to the placenta, and so does not rattle when shaken. It is used to adulterate beer, wine, &c., and is employed in ointment as a cure for some skin diseases, notably for ringworm.

**Composition.**—It owes its action to a colourless crystalline, neutral principle, called *picrotoxine* residing in the kernel of the seed, soluble in alcohol and ether, slightly soluble in boiling water. The shell contains two alkaloids, *menispermia* and *paramenispermia.*

**Properties.**—Acrid narcotic, very poisonous. Antidote. No chemical antidote known. Emetics and artificial respiration.

**No. 4.**—Case B 48.—**Bay Berries** (non official.) The fruit of Laurus Nobilis (the Sweet Bay) *Lauraceæ.* Grown in England and Southern Europe. Distinguished from Cocculus Indicus, by their shape, and the seeds being loose in the pericarp.

**Composition.**—By expression, they will yield a concrete oil called Oil of Bays, which contains a volatile oil, oleine and stearine. Used by veterinaries.

**No. 5.**—Case B 30.—**Coriander Fruit.**—The dried fruit of Coriandrum Sativum *Umbelliferæ.* A native of Italy, cultivated in Essex. Active principle is a volatile oil. Specific gravity, ·87, soluble in Ether and Glacial Acetic Acid.

**Properties.**—Aromatic carminative. It is used to disguise nauseous medicines, and in order to prevent griping. Dose, 1 to 5 minims. Preparations of Coriander Fruit:—Confectio Sennæ: Mistura Gentianæ: Syrupus Rhei: Tinct. Rhei: Tinct. Sennæ. Preparation of the oil:—Syrupus Sennæ.

**No. 6.**—Case B 63.—**Fænugreek Seeds** (non official.) The dried seeds of Trigonella Fænum—Græcum. *Leguminosæ.* Imported from Southern Europe. They are principally used in veterinary practice.

**No. 7.—Colchicum Seeds.**—The fully ripe seed of

Colchicum Autumnale: *Melanthaceæ.* Grown in England, but originally from Colchis, to which the plant owes its name.

**Composition.**—The active principle, which is *Colchicine,* is considered identical with *Veratria,* from which it may, however, be known, by not causing sneezing, and by *Colchicine* being soluble in water, whilst *Veratria* is insoluble.

**Properties.**—Produces an increased action of the skin, and diminishes the action of the heart. It subdues the pain and inflammation attendant on gout. It is used in combination with other purgatives in cases of sluggish liver. In large doses it is a narcotic, acrid poison. Antidote. Emetics and demulcent drinks, and afterwards stimulants.

Preparations: Tinctura Colchici, 1 in 8. Dose, 15 to 30 minims.

**No. 8.**—Case B 54.—**Stramonium Seeds.**—The ripe seeds of Datura Stramonium. (The thorn apple.) *Atropaceæ.* Indigenous, growing in waste places and dung-heaps.

**Composition.**—The active principle, *Daturine,* is identical with *Atropia,* and exists in all parts of the plant, but more plentifully in the seeds.

**Properties.**—It appears to have the same action on the pupil of the eye as Belladonna. It is supposed to influence the respiratory organs as an anti-spasmodic, and therefore employed in asthma. The extract has been used in spasmodic coughs, and as an Anodyne in Gastrodynia and other painful affections, and with marked success in Hay Asthma.

**Preparations.**—Extractum Stramonii, 100lbs. of seed yield about 12lbs. extract. Dose, ¼ to ½ grain.

Tinctura Stramonii, 1 in 8. Dose, 10 to 30 minims.

**No. 9.**—Case A. 35.—**Nutmegs.**—The kernel of the seed of Myristica Officinalis: *Myristicaceæ.* Imported from the Banda Islands. The fruit is pear-shaped, with a fleshy pericarp, each bearing a single seed surrounded by Mace, which is the *arillus* of Nutmeg. Mace is deep red when fresh, but becomes lighter when dried. Nutmegs are dried in the shell to prevent the attacks of insects, to which they are very liable, and are also placed in lime for the same purpose. The best are from Penang, and are known as "true," "round," or "officinal," and they are unlimed.

**Composition.**—Contains a volatile and a fixed oil. The concrete oil is sold as *Butter of mace* containing a volatile oil, a yellow and a white fat, called *Myristin.* (Nutmegs yield about 30 per cent,) The volatile oil, of which there is about 4·5 per cent., is obtained by distillation. By agitation with water it separates into two oils, one lighter and the other heavier than water, and by keeping it deposits a *stearopten* called myristicine.

**Preparations.**—Contained in Pulv. Catechu Co.
,, Cretæ Aromaticus.
Tinct. Lavandulæ Co.
Spiritus Armoraciæ Co.

Ol. Myristicæ Expressum is prepared by heating nutmeg to a paste, then pressing between hot plates. Imported in casks, covered with an endogenous leaf. Contained in Emplastrum Calefaciens and Emplastrum Picis. Volatile oil of Nutmeg contained in Spirits of Nutmeg 1 in 50: Pil. Aloe. Soc.: Spirit. Ammoniæ Aromat.

**Adulteration.**—Long or wild Nutmegs, the produce of *Myristica Fatua,* recognised by their shape.

**No. 10.**—Case B 56.—**Cubebs.**—The dried, unripe fruit of Cubeba Officinalis (commonly called Tailed Pepper.) *Piperaceæ.* Growing wild and cultivated in Java. Characters. Very much like black pepper, from which it may be known by its odour, and by having the pedicle or foot-stalk attached.

**Composition.**—Active principle is a volatile oil, yielded by distillation with water, of which it contains 10·5 per cent. Specific gravity, ·929. By keeping and oxidation it deposits a *stearopten*, called *cubeb camphor.* It also contains resin, and an alkaloid called *Cubebine,* considered to be identical with *Piperine.* Dose of oil, 10 to 30 minims, and is best administered in the form of an emulsion.

**Properties.**—A mucous stimulant in gonorrhœa. Should be given when the discharge is at its height. If no benefit is derived at once, it is useless to continue the remedy. Dose of powder, ½ to 2 drachms, usually given in prepared wafer paper.

**Preparations.**—Tincture, 1 in 8. Dose, ½ to 2 drs.

**No. 11.**—Case A 42.—**White Pepper.**—Finest Ripe Black Pepper deprived of its tegument by soaking in water till it bursts, and then removing by hand rubbing and winnowing. This is less pungent and acrid than the black, these properties being lost by ripening. The best is known as Tellicherry.

**No. 12.**—Case A. 43.—**Black Pepper.**—The dried, unripe berries of Piper Nigrum. *Piperaceæ.* Imported from the East Indies. The whole berries are considered ready to be gathered when one berry on the spike turns from green to red, as if allowed to ripen they would be less acrid, and by falling to the ground become unsaleable. They are dried in the sun and separated from the stalks by

hand rubbing. There are two varieties, the best of which is from Malabar, and the inferior quality from Penang, containing a quantity of dust. Good pepper is known by its weight, the best in commerce being called "shot" pepper.

**Composition.**—It contains a volatile oil lighter than water (isomeric with turpentine), an acrid soft resin (soluble in alcohol and ether) and piperine. *Piperine* is a nitrogenous feeble base, tasteless, and inodorous, soluble in alcohol, precipitated from it by water, also soluble in acetic acid. Nitric Acid colours it a *greenish yellow*, then *orange*, and afterwards *red*. Sulphuric Acid Conc. gives a *blood red* colour.

**Properties.**—Aromatic stimulant. Acts on the mucous membrane of the rectum, and is valuable in hœmorrhoids. Like Cubebs, it acts upon the urethral organs, and is considered to possess anti-periodic powers. Dose of powder, 5 to 20 grains.

**Preparations.**—Confect. Piperis 1 in 10. Dose, 1 to 2 drachms, (used as a substitute for Ward's Paste, a celebrated nostrum for piles, which was composed of Elecampane, Faenugreek, Black Pepper, and Honey.) Also contained in Pulv. Opii. Co. and Confect. Opii.

**No. 13.—Anethum Fruit.**—The fruit of Anethum Graveolens (or Dill), *Umbelliferæ*. Cultivated in England. A native of Southern Europe. Five primary ridges and 1 vitta in each channel. Active principle, a volatile oil, Sp. Gr. ·881, soluble in alcohol and ether, like other umbelliferous oils. (2 cwt. of fruit yield by distillation about 8 lbs. of oil.) Action. Aromatic carminative. Given to infants for flatulency.

**Preparations** of the fruit, Aqua Anethi, 1 in 10. Dose, ½ to 2 ounces.

Dill Water of shops is generally made by first rubbing the oil with sugar or magnesia, and then adding water in the proportion of 1 minim of oil to 1 ounce of water.

**No. 14.—Anise Fruit.**—The dried fruit of Pimpinella Anisum. *Umbelliferæ*, cultivated in Malta, Spain, and Germany. Characters, 5 primary ridges, with 3 vittæ in each channel. To be carefully compared with Conium fruit. Part used is a volatile oil, obtained by distillation in Europe, and also from Illicium Anisatum (the Star Anise), *Magnoliaceæ*, distilled in China. The latter is now considered the better oil.

**Composition.**—The oil is composed of 2 volatile oils, Elæopten, 75 parts, and Stearopten, 25 parts. The former is isomeric with turpentine. The specific gravity of the oil is ·985, which increases by age. It is soluble in all proportions in alcohol, but spirits of wine, whose specific gravity is ·84, only dissolves ·42 per cent. of its weight. *Test.*—Concretes at 50°, and does not liquify again under 60°. By exposure, it forms a resin, and it is then less liable to concrete.

**Adulterations.**—(1.) Spermaceti, detected by shaking up with cold spirit, in which the oil is soluble and spermaceti insoluble. (2.) Camphor may be detected by its odour. Dose of oil, 1 to 5 minims, given on sugar.

**Properties.**—Aromatic and Carminative. Combined with purgatives, to diminish griping.

**Preparations.**—Essentia Anisi, 1 in 5. Dose, 10 to 20 minims; also contained in Tinct. Opii. Ammoniata; and Tinct. Camphor. Co.

**No. 15.—Hemlock Fruit.**—The dried, ripe fruit of *Conium Maculatum*, (Spotted Hemlock). *Umbelliferæ*. Indigenous. The Student will observe that it is destitute of *vittæ*, and has 5 crenulated ridges.

**Composition.**—The active principle is *Conia*, a volatile liquid alkaloid in combination with *Conic Acid*. It may be isolated by distillation with Liquor Potassæ. It is soluble in Alcohol and Ether, slightly soluble in water, coagulates Albumen, and gives to Sulphuric Acid a colouration, first red, and afterwards changing through purple to green.

**Properties.**—Narcotic and sedative, acting especially on the spinal cord, used to allay cough in phthisis and spasmodic asthma; sometimes to ease the pain in cancerous affections. It is a cerebro-spinal poison, paralysing the muscles, and causing death by asphyxia. *Antidotes.* Emetics, purges, and diffusable stimulants.

**Administration.**—As Tincture, 1 in 8. Dose, ½ to 1 drachm.

**No. 16.—Carrot Fruit,** (non official.)—The ripe fruit of Daucus Carota, *Umbelliferæ*. Shown in this drawer, so that the Students may learn to distinguish them from poisonous umbelliferous fruits. The root of carrots is sometimes used as a poultice to fœtid sores.

**No. 17.**—Case B. 60.—**Fennel Fruit.**—The fruit of Fœniculum Dulce, *Umbelliferæ*, imported from Malta. *Varieties*, "shorts" and "longs," the latter the better of the two.

**Composition.**—The active principle is a volatile oil analagous to that of Anise.

**Properties.**—Carminative, used to relieve flatulency.

**Administration,** as Aqua Fœniculi, 1 in 10. Dose, 1 to 2 ounces.

**No. 18.**—Case B. 51.—**Cumin Fruit,** (non official.) The fruit of *Cuminum Cyminum*, *Umbelliferæ*. Imported from Malta and Sicily,

**Composition.**—A volatile oil, having a disagreeable odour, faintly recalling caraway.

**Properties.**—Carminative, employed chiefly by veterinaries.

## DRAWER B.

### GUMS, RESINS, &c.

**No. 1.**—Also Case B. 29.—**Gamboge.**—A gum resin, obtained from the leaves and twigs of Garcinia Morella, *Guttiferæ*, imported from Siam.

*Varieties.*—(1.) *Pipe Gamboge.* Usually the best. Prepared by running the juice from the leaves into pieces of bamboo and allowing it to concrete. (2.) *Lump Gamboge.* A common variety not cast in bamboo.

**Composition.**—Seventy-five per cent. of a resin (Gambogic Acid) and twenty-five per cent. of gum.

**Adulteration.**—Fragments of wood and starch. The latter detected by turning green with Iodine. Solutions of Gamboge are incompatible with Lead, (Yellow Precipitate) Iron and Copper (Brown precipitates.)

**Properties.**—Drastic purgative more powerful than Colocynth, but less so than Croton Oil. Employed in constipation, and sometimes as an Anthelmentic. Administration as Pil. Cambog. Co: 1 in 6 nearly. Dose, 5 to 10 grains.

**No. 2.**—Also Case B. 9.—**Guaiacum Resin.**—A resin obtained by natural exudation, incision, or heat, from the stem of Guaiacum Officinale, *Zygophyllaceæ*. Imported from San Domingo and Jamaica, sometimes in tears, but more frequently in lumps.

**Composition.**—Guaiacum Resin, Guaiacic Acid and Extractive matter; soluble in Alcohol, insoluble in water.

The Alcoholic solution is coloured blue by Oxidation, or by contact with Gluten or Gum Arabic. The alcoholic solution colours the inside of a potato peeling blue.

**Adulteration.**—Chiefly common resin, detected by odour on heating, or by pouring an alcoholic solution into water, and carefully adding Liquor Potassæ until the liquid is clear. A further addition of Potash will then cause a precipitate if resin be present.

**Properties.** — Alterative stimulant, administered in Chronic Rheumatism, Syphillitic, and Scrofulous Skin Disease, &c.

**Administration.**—(1.) In powder, 10 to 30 grains. (2.) Mistura Guaiaci, 1 in 40. Dose, ½ to 2 ounces. (3.) and best, Tinctura Guaiaci Ammoniata, 1 in 5. Dose, 1 drachm, shaken up into an emulsion with a little mucilage. It is also contained in Pil. Hydrarg. Subchlor. Co.

**No. 3.**—Also Case A. 41.—**Camphor.**—A concrete volatile oil extracted from the wood of Camphora Officinarum, *Lauraceæ*. Imported from China and Japan. The crude Chinese Camphor is imported in chests, and the Japanese Camphor in tubs, and is purified by sublimation into glass bulbs, which are then broken, and the camphor removed.

**Composition.**—A stearopten $C_{10} H_{16} O$, very slightly soluble in water, (1 in 1,000) freely in Alcohol and Ether, and slightly volatile at ordinary temperatures. Melts at about 300°, and sublimes at 400°.

**Substitutions.**—(I.) Artificial Camphor prepared by passing Hydrochloric Acid into Turpentine. Detected by odour on burning. (2.) Borneo Camphor, from the Dryobalanops Camphora, distinguished by not becoming

liquid, like ordinary camphor, when acted on by Hydrochloric Acid Gas.

**Properties.** — Diaphoretic, anti-spasmodic. Given in fever, mania, spasmodic diseases, and recently recommended in Diarrhœa. In large doses it is a sedative, and as such is exhibited with diluents in chronic gout. Dose, 2 to 10 grains.

**Administration.**—(1.) Aqua Camphoræ, ½ oz. to the gallon. Dose, 1 to 2 ounces. (2.) Spiritus Camphoræ 1 in 10. Dose, 10 to 30 drops, on sugar. (3.) Tinctura Camphoræ Co. 30 grains in 20 ounces, with 40 grains of powdered opium. Dose to one drachm. (The old Paregoric Elixir given to allay coughing.) (4.) Linimentum Camphoræ, 1 in 4 of olive oil. (5.) Linimentum Camphoræ Co. 1 in 8 nearly of Rectified Spirit, with the addition of Ammonia and Oil of Lavender. Much used in Neuralgia.

Camphor also enters into, Ung. Plumbi Acet. Co. Ung. Hydrarg Co., and all liniments except Calcis, Crotonis, Ammoniæ, and Potassii Iodidi.

*Antidotes.*—Chlorine water with purgatives, and some say coffee, but this is disputed.

**No. 4.**—Also Case B. 4.—**Mastich.**—A resin exuding from incisions in the stem of Pistacia Lentiscus. *Anacardiaceæ.* Prepared in Scio, and imported from the Levant. *Varieties.*—(1.) The Mastic which exudes from the cut, and hardens on the stem, is tear Mastich, which is the best. (2.) That which drops on the ground is common lump Mastich.

**Composition.**—90 per cent. resin (soluble in alcohol), 10 per cent. Masticin (insoluble in alcohol) and a little volatile oil. Its solution in Ether or Chloroform is used for coating pills and stopping teeth.

**No. 5.**—Also Case A. 37.—**Gum Juniper.**—(Non official.) A resin obtained from the stem of the Callitris Quadrivalis, *Coniferæ.* (Common name, *Sandarach,* and when powdered it is called *Pounce.*) It is used by painters and varnish makers, but it is of no medicinal value. Easily distinguished from Mastich by being usually in larger pieces, and less shining in appearance.

**No. 6.**—Also Case B. 22.—**Opium.**—The juice which exudes from incisions in the unripe capsules of the Papaver Somniferum *Papaveraceæ,* and inspissated by spontaneous evaporation. Grown in Asia Minor, and imported chiefly from Smyrna and Constantinople. *Varieties.* (1.) *Smyrna Opium* is the best, and is usually in roundish masses, covered with poppy leaves, and dotted over with red fruits of *Rumex.* It blackens by keeping, and yields on an average from 8 to 10 per cent. of Morphia. (2.) *Constantinople Opium* is usually found in cakes enclosed in a large poppy leaf, with midrib very visible, running up the middle of the cake. It is sometimes very good, but is unequal in quality. (3.) *Persian Opium* is very rare, but is in sticks, covered with smooth paper. It is not a good variety. (4.) *Egyptian Opium* is in cakes, covered with a distinctly palmate leaf, does not blacken by keeping, and is next in value to Constantinople. (5.) *Indian Opium* never comes to this country. It is usually in bladders, and is consequently called *cannon ball opium.*

**Composition.**—Meconic Acid, in combination with several alkaloids, the chief of which may be noted to be Morphia, Codeia, Narcotia, Thebaia, Narcein and Meconin, together with an odoriferous volatile substance, and dark extractive matter. Morphia $C_{17}H_{19}NO_3H_2O$ is known from Codeia and Narcotia by being soluble without de-

composition in Liquor Potassæ. Both Morphia and Narcotia are coloured *yellow* by Nitric Acid, and *blue* by Ferric Chloride; while Codeia and Thebaia are not so affected. Meconic Acid gives a *blood red* with Ferric Chloride *not* discharged by Mercuric Chloride.

**Adulterations.** — Sand, small stones, starch, lead bullets, and all sorts of rubbish; all detected by washing the opium on a sieve, except the starch, which is detected in a cool decoction by Tincture of Iodine.

**Properties.**—It arrests most of the secretions, except perspiration, which it assists. In large doses it produces irresistible tendency to sleep and insensibity to pain. In most persons the recovery from a full dose of opium is attended with nausea, headache, giddiness, and constipation. It is employed in inflammatory diseases; in fevers, when it is desired to allay delirium; for diarrhœa, and generally as an anodyne to diminish and relieve the spasms of pain in acute organic disease. Its applications are most various, and it is one of the most valuable medicines we possess in the hands of a judicious practitioner. *Antidotes.*—Emetics and the stomach pump, coupled with continual rousing of the patient, and affusion of cold water on the head and chest.

**Administration.**—In powder, dose, ½ to 2 grains, but 1 grain is always looked upon as the medium adult dose; also as (1.) *Confectio Opii*, 1 in 40. Dose, 5 to 20 grains. (2.) *Extractum Opii* (100 opium in 50 extract.) Dose, ½ to 1 grain. (3.) *Extractum Opii Liquidum*, 1 of extract in 20. Dose, 10 to 30 minims; 1 grain opium in 14 minims. (4.) *Pulvis Opii Compositus*, 1 in 10. Dose, 2 to 5 grains. (5.) *Tinctura Opii (Laudanum)* 1 in 13⅓. Dose, 10 to 30 minims. (6.) *Tinctura Opii Ammoniata*, 1 in 96 Dose,

½ to 1 drachm. (7.) *Trochisci Opii*, each containing $\frac{1}{10}$ grain of extract. (8.) *Vinum Opii*, 1 of extract in 20 of sherry, flavoured with cinnamon and cloves. Dose, 10 to 40 minims. (9.) *Pilula Saponis Co.* 1 in 6 nearly. Dose, 3 to 6 grains, together with the following :—

| Name. | Proportion of Opium. |
|---|---|
| Pil Ipecac. cum Scilla . . . . | 1 in 23 |
| ,, Plumbi ,, Opio . . . . | 1 ,, 8 |
| Pulvis Cretæ Aromaticus cum Opio . . | 1 ,, 40 |
| ,, Ipecac. Co. . . . . | 1 ,, 10 |
| ,, Kino. Co. . . . . | 1 ,, 20 |
| Tinct. Camphoræ Co. . . . . | 1 ,, 240 |

The following Table exhibits the amounts of the chief preparations of Opium which are respectively equal to one grain of powdered Opium, as nearly as can be calculated :—

| | |
|---|---|
| Confectio. Opii. . . . . | 40 grains. |
| Extractum ,, . . . . . | About $\frac{6}{10}$ grain. |
| ,, ,, liquidium . . | ,, 14 mimims. |
| Pil. Plumbi. cum Opio. . . | 8 grains. |
| ,, Saponis. Co. . . . | 6 ,, |
| Pulv. Cretæ aromat. cum. Opio. . | 40 ,, |
| ,, Ipecac. Co. . . . . | 10 ,, |
| ,, Kino. Co. . . . . | 20 ,, |
| Tinct. Camphoræ Co. . . . | ½ fluid ounce. |
| ,, Opii . . . . . | 14½ minims. |
| ,, ,, Ammoniata . . | About 73 minims. |
| Troschisci Opii. . . . . | 10 lozenges. |
| Vinum . . . . . | About 14 minims. |

Opium is also administered in the form of an Enema containing ½ drachm of Tinctura Opii, and 2 ounces Starch mucilage. For external use, we have *Emplastrum Opii*, 1 in 10, and *Linimentum Opii*, 1 in 2. *Morphia* is extracted

and administered as *Morphiæ Hydrochloras*. Dose, $\frac{1}{8}$ to $\frac{1}{2}$ a grain, and *Morphiæ Acetas*, $\frac{1}{8}$ to $\frac{1}{2}$ a grain. These salts enter into the following preparations :—

| | Proportion. | Dose. |
|---|---|---|
| Liq. Morphiæ Acetatis | 1 in 123 | 10 to 60 min. |
| ,, ,, Hydrochlor. | 1 ,, 123 | 10 ,, 60 ,, |
| Suppositorum Morphiæ | $\frac{1}{2}$ gr. in each. | |
| Trochisci ,, | $\frac{1}{36}$ ,, ,, ,, | 1 to 6 loz. ,, |
| ,, et Ipecac. $\frac{1}{12}$ gr. Ipecac. | $\frac{1}{36}$ ,, ,, ,, | 1 to 6 ,, ,, |

**No. 7.**—And Case A. 41.—**Burgundy Pitch.**—A resinous exudation from the stem of Abies Excelsa—*Coniferæ*,—which has been melted in hot water and strained through a coarse cloth. Stated in the B. P. to be imported from Switzerland, but recently asserted to be the produce of Finland and the Black Forest.

**Composition.**—The resinous exudation, as it comes from the Spruce Fir, is an oleo-resin, but, by melting and straining, the solid impurities are removed and much of the volatile oil dissipated. As prepared, it is therefore chiefly resin, with a little volatile oil. It is soluble in Spirits of wine, and in twice its weight of Glacial Acetic Acid. An inferior Burgundy Pitch is made by melting resin, and stirring in a little Palm Oil, water, and yellow ochre. When treated with Glacial Acetic Acid, the mixture is not clear, and afterwards separates into two layers.

**Properties.**—For making rubifacient and strengthening plaisters, but causes great irritation in certain people.

**Application,** as Emplastrum Ferri, 2 in 11 ; Emplastrum Picis, 1 in 2. Good Burgundy Pitch should give off no water when heated.

**No. 8.—Resin.**—The residue left after the distillation of Turpentine from the oleo-resin of various species of

Pinus and Abies, *Coniferæ*. Obtained chiefly in America and Northern Europe. The former is the better of the two, being free from specks.

**Composition.**—The oleo-resin, which runs from an incision in the tree, is called crude turpentine. When this is submitted to distillation with water, the volatile oil passes over, and is sold as oil of turpentine, while the residue in the retort, ladled into casks in its warm state, solidifies when cold and becomes resin. It contains Colophonic, Pinic, and Sylvic Acids. It is soluble in turpentine, miscible with wax and fixed oils, and is turned deep red by strong Sulphuric Acid.

**Properties.**—Diuretic, but very seldom given internally. It is used to give adhesiveness to ointments and plaisters, and as an external application it is somewhat stimulant.

**Application.**—(1.) Unguentum Resinæ, 1 in 3½, useful in chronic ulcer. (2.) Emplastrum Resinæ, 1 in 9½; also contained in the following Emplastra.—Califaciens, Cantharidis, Hydrargyri, Picis, Saponis, and Charta Epispastica.

**No. 9.**—Case B. 10.—**Thus.**—The crude turpentine of Pinus Taeda (Frankincense Pine), and Pinus Palustris (swamp pine) *Coniferæ*. Allowed to concrete by exposure to the air. Imported from the Southern States of North America.

**Composition.**—Simply a crude turpentine, or oleo-resin, from which a portion of the volatile oil has been allowed to evaporate spontaneously during exposure. Its only use in Pharmacy is to give colour and consistence to Emplastrum Picis.

**No. 10.**—Case B. 1.—**Olibanum** (non-official.) A gum resin, exuding from the stem of several varieties of Boswellia, *Amyridaceæ*. Imported from India, but really produced in Arabia and the Western Coast of Africa. It is the incense of the Bible, and is only now used as a fumigation, although formerly given to check discharges from the mucous membrane in bronchitis, leucorrhœa, &c.

**Nos. 11. and 12.**—Case B. 7 and 5.—**Benzoin.**—A balsamic resin obtained from incisions into the bark of Styrax Benzoin, *Styraceæ*, allowed to concrete by exposure, imported from Siam and Sumatra.

*Varieties.—Siamese Benzoin* (11 and B. 7) is the finest kind, never met with enveloped in calico. *Sumatra Benzoin* (12 and B. 5) Imported covered with white cotton cloth.

**Composition.**—Good Benzoin should be soluble in Spirits of Wine and in Liquor Potassæ. It contains from 15 to 20 per cent. of Benzoic Acid, and the remainder is chiefly three resins. The principle one (50 per cent.) is soluble in Ether, the second one (30 per cent.) insoluble in Ether, but soluble in Alcohol, and the third (4 per cent.) soluble in solution of Alkaline Carbonates. Benzoic Acid may be obtained from Benzoin by simple sublimation, and it gives a *pale red* precipitate with Ferric Chloride, which, when filtered out and digested in ammonia, yields Ferric Hydrate and Ammonium Benzoate. If the solution be then filtered, concentrated, and supersaturated with Hydrochloric Acid, the Benzoic Acid will immediately crystallize out, as it is only very slightly soluble in water. Benzoin is distinguished from the other balsams by not containing Cinnamic Acid, and consequently not yielding Benzoic Aldehyde (oil of bitter almonds) when heated with Potassium Bichromate and Sulphuric Acid.

**Properties.**—Stimulant, expectorant and diuretic. Used in chronic cough, and as a fumigation in sick rooms. Its vapour being considered antiseptic and of use in whooping cough.

**Administration.**—In powder up to 40 grains, as Tinctura Benzoini Composita (Friars' Balsam) 1 in 10. Dose, ½ to 1 drachm, in an emulsion of mucilage. Benzoic Acid is useful in Calculous disorders. In passing through the system it unites with Glycocoll, forming Hippuric Acid. It is contained in Tinctura Camphoræ Co. 2 grains to 1 ounce, and in Tinct. Opii. Ammon. 9 grains to 1 ounce.

**Nos. 13 to 18.**—Case B. 23 to 28.—**Aloes.**—Inspissated juices from the leaves of various species of Aloe, *Liliaceæ*. The juice exists in vessels found beneath the epidermis, and is obtained by cross-cutting, or breaking the leaf, when it exudes in an almost colourless condition, becoming dark by exposure.

*Varieties.*—No. 13 and Case B. 23.—**Barbadoes Aloes,** prepared in the West Indies from the leaf of *Aloe Vulgaris*, imported from Barbadoes. The Student will remark its characteristic conchoidal fracture and well defined odour. Its powder is olive-coloured, and it is usually imported in gourds. It yields, on an average, 80 per cent. of watery extract.

**No. 14,** and Case B. 24.—**Socotrine Aloes** is so called because it is produced in the island of Socotra, and imported thence *via* Bombay. The exact species yielding it is undetermined, but it is supposed to be *Aloe Socotrina*. The juice is run into skin bags and allowed to concrete by exposure. The Student will observe the bright resinous fracture and fragrant odour. Its powder is deep yellow, and it yields 50 per cent. of watery extract. It is the mildest variety of Aloes for medicinal purposes.

**No. 15.**—Case B. 26.—**Cape Aloes.**—(Non official.) Is a product of Aloe Spicata, chiefly imported from the Cape of Good Hope; the best in skins, and the inferior in chests. The Student will observe its peculiarly lustrous fracture, greenish tinge, and strong characteristic odour. The powder is yellow, and its solution in proof spirit, examined under the microscope, does not exhibit the crystals shown during the dissolving of the Barbadoes and Socrotine Aloes in that menstruum.

**No. 16.**—Case B. 25.—**Hepatic Aloes.**—(Non official.) Is probably obtained from a similar source to the Socotrine, being but an inferior variety, differing only in its being prepared by artificial heat, and also imported *via* Bombay. The Student will observe its liver-like colour and waxy fracture.

**No. 17.**—Case B. 27.—**Natal Aloes,** known by its *yellow* colour.

**No. 18.**—Case B. 28.—**Zanzibar Aloes,** known by its *red* colour.

The specimen of Aloes in Case C. No. 2, is a variety sometimes imported from Madras, being purchased from Arabs on the coasts of the Red Sea. It has been called "Socotrine Aloe juice," and by standing it deposits a granular matter composed of crystals of *Aloine.* When concentrated by evaporation, it yields a mass much resembling Socotrine Aloes.

**Composition.**—Chiefly Aloin (a glucoside, now recognised as the true bitter principle) and Aloesic Acid, analagous to Gallic Acid, but differing in producing a brown, instead of a blue-black, with Ferric Salts; also a resinous matter, and a little vegetable albumen. *Aloin* may be isolated by dissolving aloes in boiling water, acidu-

lated with a few drops of sulphuric acid, letting the mixture stand for 12 hours to deposit the resin, and then evaporating to a low bulk and setting aside to cool, when a quantity of yellow crystals are deposited, which can be purified by recrystallization from very dilute spirit. From fine Aloes 20 per cent. may thus be obtained.

**Properties.**—In small doses a tonic, in large doses cathartic acting especially upon the large intestines. It is very slow in operation, and is useful as a purgative for women, as it stimulates the action of the uterus, but it must not be given when the patient suffers from hœmorrhoids. Used in the form of Enema, it is very efficient as an anthelmentic in thread-worm (ascaris vermicularis.) A point in the administration of Aloes is, that if one or two grains does not act, a better effect cannot be produced by increasing the dose.

**Preparations** *(a.)* of Barbadoes Aloes:

| Name. | Strength. | Dose. |
|---|---|---|
| Enema Aloes ..... | 4 grains in fluid ounce | |
| Extractum Aloes Barbadensis..... | 8 parts from 10, nearly | 2 to 6 grs. |
| Pilula Aloes Barbadensis..... | 1 part in 2, nearly ..... | 5 to 10 grs. |
| „ „ et Ferri ..... | 1 part in 5¼ | „ |
| „ Cambogiæ composita ... | 1 part in 6, nearly ..... | „ |
| „ Colocynthidis composita | 1 part in 3, nearly ..... | „ |
| „ „ et Hyoscyami | 1 part in 4½, nearly..... | „ |

**Preparations** (*b.*) of Socotrine Aloes.

| | | |
|---|---|---|
| Decoctum Aloes compositum Extract) ..... | 4 grains in 1 fluid ounce... | ½ to 2 fl. oz. |
| Enema Aloes ..... | 4 grains in 1 fluid ounce. | |
| Extractum Aloes Socotrinæ | 1 part from 2, nearly..... | 2 to 6 grs. |
| „ Colocynthidis compositum (Extract) .... | 1 part in 2¼, nearly..... | 3 to 10 grs. |
| Pilula Aloes et Assafœtidæ... | 1 part in 4 ..... | 5 to 10 grs. |
| „ „ et Myrrhæ ..... | 1 part in 3 ..... | „ „ |
| „ „ Socotrinæ..... | 1 part in 2, nearly ..... | „ „ |
| „ „ Rhei composita.. | 1 part in 6..... | „ „ |
| Tinctura Aloes ..... | 11 grains to 1 fluid ounce... | 1 to 2 fl. dr. |
| „ Benzoini composita | 8 grains to 1 finid ounce... | ½ to 1 fl. dr. |
| Vinum Aloes..... | 12½ grains to 1 fluid ounce.. | 1 to 2 fl. dr. |

## DRAWER C.

### GUMS, RESINS, &c.

**No. 1.**—Case B. 14.—**Yellow Wax.**—The prepared Honey-comb of the Hive Bee, (purified by melting in hot-water and straining.) Zoological name, Apis Mellifica. *Hymenoptera* (gauze-winged) Insecta. Common everywhere.

*Test.*—It does not melt under 140°, (showing absence of fats.) It is insoluble in Rectified Spirits of Wine (showing absence of resin.) It is entirely soluble in Turpentine, (showing absence of pea-meal.) The cold solution is not turned blue by Iodine, (showing absence of flour, &c.)

**Preparations.**—It enters into 5 ointments and 7 plaisters.

**No. 2.**—Case B. 21.—**White Wax.**—Is yellow wax bleached by exposure to the influence of moisture, air, light, and also by the aid of chlorine.

**Composition.**—Myricin, 73 per cent., insoluble in boiling alcohol, and not saponified by potash. Cerin, 22 per cent., soluble in boiling alcohol, deposits on cooling, and saponified by potash yielding margaric acid. Cerolein, 5 per cent., soluble in boiling alcohol, and not crystallising on cooling.

**Adulterations.**—Spermaceti is mixed with it, to improve its colour.

*Test.*—It does not melt under 150°.

**Properties.**—Demulcent, principally used to give consistence to suppositories, ointments, &c.

**Preparations.**—Unguentum Simplex, 1 in 4. Also contained in Unguentum Cetacei; Ung. Plumbi Subacetatis and all Suppositories, and in Charta Epispastica, &c.

**No. 3.**—Case B. 12.—**Spermaceti.**—A concrete oily substance, obtained from the head of *Physeter Macrocephalus* (the sperm whale)—*Cetaceæ*—Mammalia—inhabiting the South Pacific and Indian Oceans. It is separated from the other head matters by pressure and filtration, and is insoluble in water and cold spirit, but soluble in boiling alcohol and ether. It does not melt under 100°. It may be reduced to powder by the help of a little spirit.

**Composition.**—It is a cetyl palmitate. When saponified it yields cetyl hydrate, instead of glycerine, thus differing from ordinary fats.

**Adulterations.**—Suet and white wax, which render it less soluble in alcohol and ether, and less laminar and shining in appearance.

**Properties.**—Demulcent. It is seldom administered internally. The ointment is one of the most useful applications for cuts, &c.

**Preparations.** — Unguentum Cetacei and Charta Epispastica.

**No. 4.**—Case A. 48.—**Cochineal.**—The dried female insect, *Coccus Cacti*—Hemiptera (or half-wings)—*Insecta.* Imported from Mexico and Teneriffe. *Varieties.*—Silver-grey and black. (1.) Silver-grey are the better of the two, and become black on exposure to the fire. These are the fecundated insects. (2.) Black. These are the males, females, and young, mixed together.

**Composition.**—Active principle Cochinellin, (the red colouring matter), soluble in Alcohol and Water. The colour is *increased* by acids, turned *violet* by alkalies, and *yellow* by chlorine and iodine, and commonly called carmine. With Aluminic Hydrate it combines to form *Lakes.*

**Adulterations.**—The black are moistened with gum-water and dusted with powdered Talc, to give them the silvery appearance of the grey. Salts of Baryta and Lead are also used with the same object.

*Test.*—The microscope, under which the greyish powder on the true insect has the appearance of down.

**Properties.**—By some considered an anodyne, and is prescribed with Potassium Carbonate for whooping cough, but is generally made of use only as a colouring agent.

**Preparations.**—Tinct. Cocci, 2½ oz. to 1 pint. Dose, ½ to 2 fluid drachms.

| | | |
|---|---|---|
| Tinct. Cinchon. Co. | 30 grs. to 1 pint | Ditto |
| ,, Cardamomi ,, | 60 grs. to 1 pint | Ditto |

**No. 5.—Sugar of Milk.**—A crystalline sugar, obtained from the whey of milk by evaporation, and allowed to crystallize on a stick. Chiefly prepared in Switzerland.

**Composition.**—Its chief constituent is Lactose $C_{12}H_{24}O_{12}$, a crystalline substance not subject to alcoholic fermentation. The sugar is hard and gritty to the teeth, and not nearly so sweet as cane sugar. It is soluble in cold water, (1 in 5) in boiling water (1 in 2½), and is only slightly soluble in Spirits of Wine. Like glucose, it reduces alkaline solutions of copper, precipitating cuprous oxide.

**Properties.**— Nutritive. When mixed with cow's milk, it forms an efficient substitute for human milk. Its use in pharmacy is to divide and dilute stronger medicinal powders.

**No. 6.—Cantharides.**—The dried beetle of *Cantharis Vesicatoria.*—Coleoptera (sheathed wings) Insecta. Imported from Hungary, Russia, and Sicily. Those from Russia are the finest.

The Student will observe the green colour of its wing cases, and its strong disagreeable odour, and that it should be free from mites and other insects.

**Composition.**—Active principle, a crystalline substance called Cantharidin (about ½ per cent.), prepared by macerating the powdered beetles in chloroform, distilling and treating the residue with Bisulphide of Carbon, to remove the fatty matters. It is soluble in chloroform, benzol, ether, volatile and fixed oils. It is also soluble in potash, and precipitated by acetic acid. It is not acted upon by ammonia. Sulphuric and nitric acids have no action on cantharidin (thereby distinguishing it from other active principles). Although isolated cantharidin is insoluble in water and cold spirits of wine, yet as it exists in the beetle, in combination with other matters, it is soluble in, and consequently capable of extraction by, these menstrua.

**Adulterations.**—The golden beetle or wasp, which is much smaller. The powder is sometimes adulterated with Euphorbium.

*Test.*—Dissolve the powder in hot spirit, filter, and on cooling, Euphorbium will be deposited.

**Properties and Uses.** — Stimulant, diuretic and vesicant. It is found useful in obstinate gleet (must be be used with care, as an overdose might produce stranguary), as a diuretic in chronic dropsy, and in chronic water on the brain. As a counter irritant applied to the skin, it produces the same effects as if given internally. A blister may be used in inflammation of every organ, except the bladder and kidney. It generally acts in from 4 to 10 hours. If $\frac{1}{100}$ of a grain of Cantharidin be applied to the tongue, it will produce a blister. Dose, in the form of a

pill, 1 to 2 grains. In large doses it acts as a virulent acrid poison.

*Antidotes.*—Empty the stomach as quickly as possible by mechanical means, or emetics. Then give demulcent drinks and opiates to remove the pain.

**Preparations.**—Tinct. Cantharidis, 1 in 80: 5 to 20 minims: (1 grain in 88 minims.)

| | |
|---|---|
| Ungt. ..... | 1 in 8 |
| Emplast. ..... | 1 in 3 |
| ,, Calefaciens | 1 in 25 |
| Acetum Cantharidis | 1 in 10 |
| Charta Epispastica | |
| Liquor ,, | 1 in 2½ |

**No. 7.—Assafœtida.** — A gum resin obtained by making incisions in the living root of Narthex Assafœtida. *Umbelliferæ.* Imported from Affghanistan and the Punjaub.

*Varieties.*—Tears and lumps. (1.) Tears, are seldom met with in commerce. They are the drops which have dried on the root, and contain less oil than the lump. (2.) Lump, in irregular masses, composed of a dark-coloured resinous substance, having tears embedded in it. When freshly cut it is *white*, but on exposure becomes *pink*, owing to oxidation. It has a peculiarly disagreeable odour and a bitter and acrid taste.

*Test.*—Heated with Sulphuric Acid it yields a *blood-red* liquid, giving off Sulphurous Gas; and when this mixture is diluted and saturated with Caustic Potash, it becomes *blue* and fluorescent. Assafœtida is almost entirely soluble in Alcohol, but very slightly in water, forming an emulsion.

**Composition.**—The active principle is a volatile oil, of which it contains about 4½ per cent. It also contains gum

25 per cent. ($\frac{2}{3}$ arabin and $\frac{1}{3}$ bassorin) and the rest resin. The oil can be obtained by distillation with water or spirits of wine. It is a mixture of 5 sulphides of a hydrocarbon. Like some other active oils, when fresh it contains no oxygen, but becomes acid by exposure, On boiling, Sulphuretted Hydrogen is evolved. The presence of Sulphur may be proved, by adding Barium Chloride with excess of Chlorine, to water distilled from the gum resin, when a precipitate of Barium Sulphate is formed. For this reason, pills made of assafœtida should be coated with Ethereal Tinct. of Tolu, before silvering, otherwise sulphide of silver would be formed. Sulphide of Mercury is also produced by combining Mercury with Assafœtida.

**Properties.**—Antispasmodic, expectorant, stimulant, and by some considered to be anthelmintic. It is of great use in hysteria, nervous debility, flatulency, spasmodic cough, and other affections of the chest, where there is no inflammation. But for the ill flavour of the drug, the Sp. Amm. Fœt. is a most valuable medicine. Dose, 5 to 20 grains, best given in the form of emulsion. The gum dissolves in the water suspending the oil and resin.

**Preparations.**—Enema Assafœtidæ, 30 gr. to 4 ozs.

| | | | |
|---|---|---|---|
| Tinct. | ,, | 1 in 8 | $\frac{1}{2}$ to 1 dr. |
| Pil. | ,, Co. | 1 in $3\frac{1}{2}$ | 5 to 10 gr. |
| Pil Aloes et Assafœt. | | 1 in 4 | 5 to 10 ,, |
| Sp. Amm. Fœt .... | | 1 in $14\frac{1}{2}$ | $\frac{1}{2}$ to 1 dr. |

**No. 8.**—Case A. 31.—**Galbanum.**—A gum resin obtained by making incisions in the stem of Ferula Galbaniflua, *Umbelliferæ*, a native of Persia and the Punjaub.

*Varieties.*—Tears and lumps. The lump is generally found in commerce.

**Composition.**—A volatile oil (which contains no sulphur) and a resin, soluble in alcohol and ether, and slightly soluble in turpentine. It also contains a gum. When heated to 26° it yields an *Indigo Blue* oil.

**Properties.**—Resembles assafœtida in action, but is less energetic. It is employed principally in the form of plaister, as an external stimulant to chronic tumours.

*Dose.*—In the form of an emulsion, 10 to 30 grains.

**Preparations.**—Emplastrum Galbani Co. 1 in 11 grs.
Pil. Assafœtidæ Co. .... 1 in 3½ ,,

**No. 9.—Kino.**—An inspissated juice, from incisions made into the trunk of Pterocarpus Marsupium. *Leguminosæ.* Imported from Malabar. To be examined side by side with extract of Logwood, for which it might be mistaken.

**Composition.**—Similar to Catechu, which see.

*Tests.*—Entirely soluble in hot water (Dragon's Blood, insoluble). Neutral to test paper (Rhatany Powder, acid). Soluble in Alcohol, but insoluble in ether.

**Properties.**—Powerfully astringent. Used for checking internal hemorrhages, also employed externally as a styptic, and as a gargle. Not so powerful as catechu. Dose, 10 to 30 grains, best as Tincture.

**Preparations.**—Pulv. Catechu Co. 1 in 5..20 to 40 grs.
,, Kino ,, 3¾ in 5.. 5 to 20 ,,
Tinct. Kino ,, 1 in 10.. ½ to 2 fl. dr.

**No. 10.** Case B. 8.—**Ammoniacum.**—A gum-resin exuding from the slightest puncture in the stem of Dorema Ammoniacum, *Umbelliferæ*, collected in Persia and the Punjaub.

*Varieties.*—(1.) In Tears, which is the best. (2.) In Lump, which is subject to adulterations, such as sand, stones, umbelliferous fruits, &c., but may be purified by melting and straining. The Student will compare this with lump benzoin. Good ammoniacum should form a *white* emulsion with water.

**Composition.**—A volatile oil, (differing from that of Assafœtida in not containing sulphur), together with 70 per cent. resin, and 20 per cent. gum. The resin is soluble in alcohol and alkalies, and partially so in ether and oils.

**Properties.**—Expectorant, and generally stimulating to the mucous membranes. Externally, it is a resolvent to scirrhus tumours, the *B.P.* plaister being an excellent application for "housemaid's knee." Dose, 10 to 20 grains in emulsion with yolk of egg.

**Preparations.**—Mist. Ammoniaci, 1 in 32.
Emplastrum ,, cum Hydrargyro. 12 in 16.
Also in Pil. Scillæ. Co. : Pil. Ipecac. cum. Scilla and Emplast. Galbani.

**No. 11,** and Case B. 19.—**Pale Catechu.**—An extract from the leaves and yonng shoots of Uncaria Gambir. *Cinchonaceæ*, prepared at Singapore, &c., by boiling in water and evaporating. The Student will observe its characteristic cubical shape. Called in commerce "Gambir," or "Terra Japonica."

**Composition.**—(1.) About 40 per cent. Tannic Acid, soluble in water and alcohol, and slightly in ether; gives a *green* with Ferric Salts. (2.) Catechuic Acid, insoluble in cold water, and formerly called Resinous Tannin. Its solution in boiling water or alcohol is precipitable by Iron,

but not by Gelatine; the latter property serving to distinguish it from Tannic Acid.

*Tests*—Entirely soluble in boiling water (absence of brick-dust.) A cold decoction is not rendered blue by Iodine (absence of starch.) 20 grains leave on ignition only ½ grain of ash. Good Catechu floats on water and melts in the mouth.

**Properties.** — A powerful astringent, valuable in diarrhœa, chronic disentery, and internal hemorrhage, also in cases of mucous discharge without inflammation, and as a gargle, or lozenges for relaxed throat.

**Preparations.**—

| | | | |
|---|---|---|---|
| Infus. | Catechu. | 1 in 27.. | 1 to 2 oz. |
| Pulv. | ,, Co. | 1 in 2½.. | 15 to 30 gr. |
| Tinct. | Catechu.. | 1 in 8 .. | ½ to 2 drs. |
| Trochisci | ,, | 1 gr. in each, | 1 to 3 loz. |

**No. 12.**—Case B. 18.—**Black Catechu,** or **Cutch.**—A non-official extract from the duramen of *Acacia Catechu.*—*Legaminosæ*—Imported from Pegu, in black masses, covered with leaves.

**Composition.**—Much richer in Tannic Acid than Pale Catechu, but less soluble in cold water, and probably non-official on that account. In Case C. 2, is the extract obtained from the Betel Nut. It is known as Colombo Catechu, and is obtained in the East Indies from the Areca Catechu, *Palmaceæ.*

**No. 13.** Case B. 15,—**Scammonium.**—A gum resin obtained from the living root of Convolvulus Scammonia—*Convolvulaceæ.* It is prepared in Syria and Asia Minor, by making a transverse cut in the root, and collecting the juice in mussel shells. When full, the shells are exposed till the juice concretes, and the resulting virgin scammony

is collected from the peasants, and exported to this country by the Smyrna merchants. The Student will observe its colour, fracture, and great friability, and it should be carefully distinguished from the resins of scammony and jalap.

**Composition.**—80 per cent. of resin, chiefly a glucoside, called *scammonin*, and about 8 per cent. of gum.

*Tests.*—Specific gravity, 1·21. Burns with a yellowish flame, and readily forms an emulsion with water. The cool decoction does not turn blue with Iodine (absence of starch.) Paper, moistened with a tincture, should not change colour with nitrous fumes (absence of Guaiacum Resin). Does not effervesce with acids (absence of chalk.) Should not leave more than 3 per cent. of ash (absence of sand, ashes, &c.) At least 80 per cent. should be soluble in ether. (Resin of Jalap insoluble.) *Dose*, 5 to 10 grains, but rarely uncombined, owing to its griping properties.

**Properties.**—A drastic purgative, less irritant than gamboge, but more allied to Jalap. Useful as a hydragogue in dropsy, and in small doses as a vermifuge for children.

**Preparations.**—Confect. Scammonii, 1 in 3; adult dose, 10 to 30 grains; children, 3 to 10 grains. Pulvis Scammonii Co. 1 in 2, 10 to 30 grs.; young children, 3 to 5 grs.

Also in Ext. Colocynthidis Co: Pil. Colocynthidis Co: and Pil. Coloc. et Hyoscyam.

Case B. 16.—**Resina Scammoniæ**, *B.P*,—A resin obtained from Scammony Root, or the gum-resin Scammonium, by means of rectified spirits of wine. That prepared from the root is more translucent, and the odour is sweeter—the yield being about 7 per cent. It is soluble in Alcohol and ether, and burns readily. Its tincture is feebly acid, and on addition of water the resin is precipitated,

in a hydrated form. By the addition of alcoholic solutions of the acetates of lead and copper, scammoniates are formed and precipitated. The colour of the solution is deepened on adding caustic potash. It is decolorised by animal charcoal, without altering its purgative properties. This resin is noted for containing more oxygen than any other yet investigated.

*Tests.*—Does not form an emulsion with water, is entirely soluble in ether (absence of Jalap resin) and does not turn the inside of a potato peeling blue. It is insoluble in oil of turpentine, thereby distinguishing it from common resin. With this latter sulphuric acid produces a deep red colour, and with scammony resin a wine red is but slowly formed. Test paper moistened with the tincture, should not change colour with Nitrous fumes (absence of guaiacum, as if this be present it will be turned blue.) Dose, 3 to 8 grains.

**Properties.**—Drastic Cathartic, having the same action as Scammonium.

**Preparations.**—Mist Scammoniæ, 2 grains to 1 oz., and is also contained in Ext. Coloc. Co.

**No. 14.**—Case B. 16.—**Jalap Resin.**—Prepared from the Jalap root in the same manner as Scammony. Good Jalap yields 18 per cent. Insoluble in water and oil of turpentine. Heated at a low temperature it fuses, giving off its peculiar odour, and at a higher temperature it burns, leaving no residue. Dose, 2 to 5 grains.

**Properties.**—Brisk Cathartic, useful in mania, and as a vermifuge.

**No. 15.**—Case B. 1.—**Bdellium** or **False Myrrh.**—Non-official. A gum resin obtained from the stem of the *Bdellium Mukul, Amyridaceæ,* a native of India. Its chief use is to adulterate Myrrh, from which it may be readily

known by becoming softened with the heat of the hand, and by its contamination with small fragments of bark, hair, and its general want of brittleness.

**No. 16.**—Case B. 2.—**Myrrh.** — A gum-resinous exudation obtained from the stem of Balsamodendron Myrrha—*Amyridaceæ*,—a native of Arabia Felix, and Abyssinia, and imported from the East Indies.

*Varieties.*—(1.) Turkey, which is the finest kind, and will be noticed to be of two qualities; (*a.*) the picked myrrh, in large pieces, and (*b.*) the grain myrrh. (2.) East Indian Myrrh. This is an inferior quality, and much adulterated.

**Composition.**—25 per cent. of volatile oil, 58 per cent. of gum, and the remainder resin. Both the resin and the gum include two modifications, soft and hard resin and gum. Soft resin, supposed to be a mixture of hard resin and volatile oil, has a strong odour, becomes softened by moderate heat, and is insoluble in ether. Hard resin has no odour, is not so readily softened, insoluble in ether, and soluble in caustic alkalies, forming *Myrrhates.* The first modification of the Gum, probably Arabin, is soluble in water, forming precipitates with salts of silver, mercury, lead, &c. The second modification is insoluble in water, and similar to bassorin. The volatile oil is soluble in alcohol, ether, and fixed oils. Sulphuric, Nitric, and Hydrochloric Acids turn its solution red.

**Adulterations and Tests.**—Various gums, resins, &c., which may be distinguished by the transparency of their fractured surfaces, and want of taste and odour. Bdellium is largely used, which see. Good Myrrh forms a white emulsion with water, the greater portion being soluble in that fluid, and the remainder in alcohol.

**Properties.**—Tonic and antispasmodic. It acts upon the mucous membrane. Applied locally, it is a mild astringent. It is useful, combined with chalybeates, in chlorosis, &c. The tincture, when diluted, forms a useful gargle in relaxed throats.

*Dose of Powder*, or in the form of pill and emulsion, 10 to 30 grains.

**Preparations.**—Tincturæ Myrrhæ, 1 in 8. Dose, ½ to 1 drachm.

Pil. Aloes et Myrrhæ, ½ in 3.

Also contained in Pil. Rhei Co: Pil. Assafœt. Co: Decoct. Aloes Co: Mist. Ferri Co.

**No. 17.—Acacia.**—A gum exuding spontaneously, or by incisions made in the stem of *Acacia Vera*, and *Acacia Arabia*, *Leguminoseæ*, collected in Eastern Africa, and imported from Alexandria. The Student will notice the almost white and cracked appearance of the rounded masses.

*Varieties.*—Gum Acacia (Arabic, Turkey, or Alexandrian), which form the only official gum. Inferior gums are obtained from Senegal, Barbary, the East Indies, and Australia; readily distinguished by the difference in colour, and a less amount of solubility.

**Composition.**—Chiefly Arabin, which is soluble in water, but insoluble in alcohol, ether, &c. It may be viewed as a gummate of calcium, yielding a white precipitate of Plumbic Gummate with plumbic oxyacetate and of Calcium Oxalate with Ammonium Oxalate.

*Tests.*—Freely soluble in water, and a cooled decoction of the powder should not be turned blue by Iodine (absence of starch.)

**Properties.**—Demulcent and emollient, given to diminish inflammation of the urinary organs; also used to suspend resins and oleo-resins in water as emulsions, and as an excipient for pills. The pulverised gum is useful to suspend heavy powders. The mucilage (which should always be fresh) is used with fixed oils in the proportion of ¾ to ¼, with balsams and spermaceti in equal parts. Resins require 2 parts, and Mixtures 5 parts. It is preferable with some oils to use the pulverised gum.

**Preparations.**—Mucilago Acaceæ 1 to 1½. Also contained in Mistura Cretæ: Mistura Guaiaci: Pulv. Amygdalæ Co: Pulv. Tragacanthæ Co. and in all lozenges.

**No 18.**—Case B. 6.—**Tragacanth.**—A gum which exudes from the stem of Astragalus verus, *Leyuminosæ*, a native of Asia Minor, and imported from Smyrna. The best is obtained by incisions in the stem, while the more common varieties exude naturally.

**Composition.**—A little arabin, soluble in water, and the remainder *bassorin*, insoluble in water, but soluble in alcohol. The variety of arabin which exists in this substance is called *Tragacanthin*, and distinguished by its watery solution not being precipitated by spirit.

*Tests.*—Scarcely soluble at all in cold water, but absorbs the latter, and swells to a jelly, which is rendered violet by Iodine.

**Properties.**—Demulcent and emollient, but is chiefly employed as an excipient in pills, and to suspend heavy powders in water, or as a vehicle for the administration of small doses of active drugs. Dose, from 1 drachm.

**Preparations.**—Mucilago Tragacanthæ 1 in 80. Dose from 1 oz. Pil. Tragacanthæ Co. 1 in 6. Dose 10 to 60 grains. Also contained in Pulv. Opii. Co. and Confectio. Opii.

# DRAWER D.

## LEAVES, &c.

**No. 1.—Lobelia.**—The dried flowering herb of Lobelia inflata, *Lobeliaceæ;* collected in August and September, and imported from North America. The Student will observe the angular stem, alternate leaves (hairy on the under surface), and the flowers in racemes. The best quality is met with in compressed rectangular parcels enclosed in blue paper. The seeds of this plant have a characteristic reticulated appearance when viewed under the microscope.

**Composition.**—The active principle is a liquid alkaloid called *lobelina,* soluble in alcohol and ether, and unites with acids to form crystalline salts. It also contains a volatile oil, an acrid resin, and *lobelic acid.* The first named being the odoriferous principle. The narcotic matter, which is the *lobelina,* can be extracted by proof spirit.

**Properties.**—In small doses, expectorant and diaphoretic, in full doses emetic and cathartic. Useful in spasmodic asthma, and as an adjunct to diuretics. Too freely administered, it acts as a narcotic poison, accompanied by dilation of the pupil of the eye. *Antidotes.*—Speedy evacuation of the stomach, succeeded by powerful stimulants, and finally by demulcents to allay irritation. Dose, in powder, 1 to 3 grains as an expectorant, and as an emetic, to 15. (1 drachm has caused death.)

**Preparations.**—Tinct. Lobeliæ, 1 in 8 : 10 to 30 ms.
Tinct. ,, Ætherea, 1 in 8 : 10 to 30 ms.

**No. 2.**—Case B. 36.—**Matico.**—The dried leaves of Artanthe elongata, *Piperaceæ;* imported from Peru. The Student should observe the tessallated structure of the

leaves, and the pubescence on the under surface, as well as the venation; which latter should be compared with that of the leaves of *Artanthe Adunca*, often substituted for the proper Matico.

**Composition.**—A volatile oil, a resin, and a bitter principle. Its active properties being due to the two former.

**Properties.**—A powerful topical astringent. Although useful in amenorrhæa, it acts better as a check to hemorrhage than to mucous discharges.

**Preparation.**—Infusum Maticæ, 1 in 20: 1 to 4 fl. oz.

**No. 3.—Senna,** non official. This is the commonest variety of East Indian Senna; known in commerce as Mecca Senna, and supposed to be the produce of Cassia elongata, *Leguminosæ*.

**No. 4.—Senna.**—Non official. In this compartment is another inferior variety of East Indian Senna, chiefly from Cassia elongata and Cassia Officinalis, *Leguminosæ*. This and the last variety are shown to enable the Student to judge of the quality of Senna by comparison with the following:—

**No. 5.—Tinnevelly Senna.**—The dried leaflets of Cassia elongata, *Leguminosæ;* cultivated in Southern India. The Student will observe the fine lanceolate leaves, very free from adulteration. This variety is by some preferred to the following one, as they consider it is not so apt to gripe.

**No. 6.—Alexandrian Senna.**—The dried leaflets of Cassia lanceolata and cassia obvata, *Leguminosæ;* imported from Alexandria, and generally picked free from stalks and legumes, before being sold as first quality. In studying

senna leaves, the Student should specially observe their peculiar venation and unequal base, and he will thus learn to distinguish the leaves of *true* senna, from those of *Solenostemma Argel*, *Tephrosia Apollinea*, *Coriaria myrtifolia*, and *Colutea arborescens;* specimens of which will be found enclosed in small tubes in this division.

**Composition.**—The chief principle is an uncrystallisable glucoside called *Cathartin*, soluble in water and alcohol. Senna also contains a volatile oil, a resin, and other inactive matters.

**Properties.**—Purgative, producing watery stools by acting upon the lower extremities. It is by some considered rather heating, and is apt to gripe and nauseate. Dose, in powder, ½ to 2 drachms, rarely used.

**Preparations.**—Confectio. Sennæ, 1 in 11 nearly: 1 to 2 drachms.

| | | | |
|---|---|---|---|
| Infusum | ,, | 1 in 10 nearly: | 1 to 2 fl. oz. |
| Tinctura | ,, | 1 in 8 ,, | 1 to 4 fl. drachms. |
| Syrupus | ,, | 1 in 2 ,, | 1 to 2 ,, |
| Mistura | ,, | Co. | 1 to 1½ fl. oz. |

**No. 7.**—Case B. 37.—**Cusso.**—The dried flowering tops of Brayera anthelmintica, *Rosaceæ*. Collected in North-Eastern Abyssinia before the fruits are ripe.

The Student will observe their colour and hairy pedicles, so as to know them from elder flowers.

**Composition**—A volatile oil, acrid resin, tannic acid and *koussine*. An infusion of Cusso turns green with Tinct. Ferri. Perchlor.

**Properties.**—Anthelmintic, used especially in cases of tape worm, but by some it is thought to be comparatively useless.

**Preparation.**—Infusum Cusso, ¼ oz. in 4 oz. for one dose, to be taken without straining, made palatable if desired with honey and lemon juice, and followed by a dose of castor oil.

**No. 8.—Indian Hemp.**—The dried flowering tops of the female plant of Cannabis sativa, variety, Indica, *Cannabinaceæ;* cultivated in India. It is simply ordinary hemp which has developed more resin, by being grown in a hot country like India. The hemp from which the resin has not been extracted is alone official; such removal of the resin being a common fraud.

**Composition.**—Volatile oil, gummy and extractive matters, together with the active resin called *Cannabin*, which is soluble both in alcohol and ether.

**Properties.** — Narcotic and antispasmodic. It has been used with some success in neuralgia, tetanus, and even in hydrophobia, and the Tincture has been exhibited with benefit in difficult menstruation.

**Preparations.**—Extractum Cannabis Ind. Dose, ¼ to 1 grain, 1 of extract from 6 of good hemp. Tinct. Cannabis Ind. 1 of extract in 20 of rectified spirit. Dose, 5 to 20 minims, rubbed up with 1 drachm of mucilage, and then 1 oz. of water added carefully with constant rubbing to form an emulsion.

**No. 9.—Aconite Leaves.** — The fresh leaves and flowering tops of Aconitum Napellus, *Ranunculaceæ*, gathered when about one-third of the flowers are expanded, from plants cultivated in Britain. This plant, commonly called Monkshood and Wolfsbane, is not truly indigenous, although extensively grown in this country. It is an herbaceous plant, with a conical root and perennial erect stem; leaves numerous, simple, palmatisected, with pin-

natifid lobes; dark green above, pale beneath; inflorescence a raceme,—indefinite—of dark blue flowers, with the calyx petalloid and galeate constituting the whole of of the outwardly visible floral envelopes; fruit apocarpus, consisting of three follicles. The Student should carefully examine these characters as showed by the mounted plant in the herbarium, and compare the *true medicinal* aconite with the garden varieties, such as A. variegatum: A. paniculatum, &c. It should also be contrasted with Delphinium Staphysagria, and the various garden Larkspurs.

**Composition and Properties.** — See Drawer F. No. 10.

**Preparation.**—Extractum Aconiti; strength variable Dose ½ to 2 grains.

**No. 10.—Henbane Leaves.**—The leaves and young branches of Hyoscyamus Niger,—*Atropaceæ*,—Indigenous. There are two varieties of Henbane,—the annual and the biennial. The latter is the official kind, and its leaves should be gathered when about two-thirds of its flowers are expanded. In examining the plant of Henbane, the Student will observe that it is of a pale green colour and pilose both in stem and leaf. The leaves are simple oblong, with sinuate dentate margin and sessile. The inflorescence is axillary, and the corolla of a pale sickly yellow with purple streaks. The fruit, which is capsular, is called a pyxis, from the fact of its dehiscing transversely by a lid at the top like a box.

**Composition.**—The chief active agent is an alkaloid *Hyoscyamia*, analagous to Atropia, but rather more soluble in water. It powerfully dilates the pupil of the eye, and when volatilised yields ammonia.

**Properties.**—Narcotic, soporific, and anodyne; milder than Belladonna or Stramonium. It allays pain and decreases nervous excitement, without confining the bowels. It is much used to mix with strong purgatives, such as Colocynth, to diminish griping. In a poisonous dose it causes delirium, and very rapidly succeeding coma and death. *Antidotes.*—Emetics, cold affusion, stimulants, and liquor potassæ, because caustic alkalies rapidly decompose hyoscyamia.

**Preparations.**—Extractum Hyoscyami 5 from 100 of fresh leaves. Dose, 3 to 6 grains, but up to 20 grains may be given. Tinctura Hyoscyami 1 in 8. Dose, ½ to 1 fl. drachm, but double that may be administered in severe cases.

**No. 11.—Belladonna Leaves.**—The leaves and young branches of Atropa Belladonna—*Atropaceæ.* They may be collected from wild and cultivated British plants, when the fruit commences to form. The Student will observe the simple ovate leaves, with acute apex, entire margin, unequal base, and shortly petiolate. The inflorescence is extra axillary, and the corolla monopetalous and campanulate, and of a sickly purple colour. The fruit baccate, but not a true berry, as it is superior and two celled. Its colour is black and shining, and it has the persistent calyx attached.

**Composition and Properties, see Belladonna Root.**—Drawer F. No. 6.

**Preparation.**—Extractum Belladonnæ 4 from 100. Dose, ½ to 1 grain. Tinctura Belladonnæ 1 in 20: 5 to 20 minims. The extract is a constituent of Emplastrum Belladonnæ and Unguentum Belladonæ.

**No. 12.—Digitalis Leaves.**—The dried leaves of Digitalis purpurea, *Scrophulariaceæ ;* gathered from the wild indigenous plants of the Purple Foxglove, when two-thirds of the flowers are expanded. The Student will particularly observe the simple ovate lanceolate leaves, with acutely crenate margin and sheathing petiole. They are smooth on the upper, but pubescent on the under surface. The inflorescence is a raceme of purple, somewhat bell-shaped flowers, with irregular labiate opening (to which shape the special name of digitate has been applied) and having characteristic spots inside the lip. The stamens are didynamous, and the fruit is a capsule, dehiscing septicidally, and with a persistent calyx. A careful observance of these points will distinguish it from the *Inula Conyza, Compositæ;* the *Verbascum Thapsus, Scrophulariaceæ,* and the *Symphytum officinale, Boraginaceæ,* all of which should be examined by the Student. Another point worth observing, is the difference in shape between the first and second year's leaves, the former being more lanceolate than the latter.

**Composition.**—The active principle is a glucoside called *Digitalin*—$C_{27}H_{45}O_{15}$—a white amorphous body, soluble in alcohol, but only slightly soluble in water; it dissolves in acids, but does not form neutral compounds. With Sulphuric Acid, it gives a characteristic *violet* colour when exposed to the action of Bromine. This test, however, has also been lately found to be characteristic of some alkaloids, and the best test is to mix the suspected substance with a dilute solution of dried bile and add Sulphuric acid, when a magnificent *red* colour is produced. Digitalin is official in the *B.P.* and the dose is from $\frac{1}{60}$ to $\frac{1}{30}$ of a grain, but it is a very poisonous substance, and seldom prescribed.

**Properties.**—Sedative, diuretic, and diminishes the action of the heart. The Tincture is valuable in *Delirium Tremens* in drachm doses, but its action must be carefully watched, as a fatal dose produces vomiting, diarrhœa, convulsions, loss of sight, intermittent pulse, coma, and Death. The antidotes are, astringent infusions and stimulants, first placing the patient in a horizontal position, emptying the stomach by the pump, and applying artificial respiration.

**Preparations.**—Tinctura Digitalis, 1 in 8. Dose, 10 to 30 minims.
Infusum ,, 30 grs. to 10 oz.: 2 to 4 drachms.

**No. 13—Conium Leaves.**—The dried leaves of Conium maculatum — *Umbelliferæ*—Indigenous. The fresh leaves and young branches of the Spotted Hemlock, gathered when the fruit begins to form, are also official. With regard to this plant, the Student should carefully observe the round glabrous stem with purplish spots, and *not* swollen at the nodes;—the shining dark green leaves compound tripinnate, and sometimes decompound;—the inflorescence a compound umbel, with both a general and a partial involucre, and the fruit a cremocarp, consisting of two mericarps, having five wavy primary ridges, and the channels destitute ef vittæ. The observance of these points will serve to distinguish Conium from all other umbelliferous plants; but the student should also observe the distinctive characters of *Æthusa Cynapium* (Fool's Parsley), *Cicuta Virosa* (Water Hemlock), *Œnanthe Crocata*, (Drop Wort), *Œnanthe Phellandrium* (Fine leaved Drop Wort), &c. When any part of a true Conium plant is rubbed with Liquor Potassæ, a characteristic mouse-like odour of *Conia* is evolved.

**Composition and Properties,** see Drawer A. No. 15, Conium Fruit.

Dose of pulverised leaves, 2 to 8 grains.

**Preparations.**—Extractum Conii. Dose, 2 to 6 grains.
Succus ,, ,, 30 ms. to 1 dr.
Cataplasma ,, ,, 1 in 14.

Also enters into the composition of Pil. Conii. Co. and Vapor Coniæ.

**No. 14.**—Case B. 38.—**Chamomile.**—The dried single and double flower heads of Anthemis Mobilis, *Compositæ*, gathered from wild and cultivated indigenous plants. In examining the true chamomile, the Student will observe that it is a prostrate, or only feebly erect plant, with compound bipinnate leaves, sessile, and having subulate linear leaflets. The inflorescence is a *capitulum*, solitary and terminal, having the florets of the disk yellow, tubular, and hermaphrodite, and the florets of the ray white, ligulate, and only pistillate. In the double chamomile, most or all the florets have become converted by cultivation into white ligulate female florets. In the single heads the disk is conical, and covered with broad scales nearly as long as the central florets. The Chamomile plant should be carefully compared with *Matricaria Camomilla*, (wild chamomile), *Matricaria Parthenium* (Feverfew), *Anthemis Cotula*, (stinking Mayweed, &c.)

**Composition.**—A volatile oil, a bitter extractive matter, a resin, and a little Tannic acid, together with an acid analagous to *Valerianic acid*. The activity of chamomiles depends entirely on the two first named ingredients. The volatile oil is prepared by distillation with water, it becomes yellow by keeping, and its specific gravity is ·908.

The British manufactured oil is the only official and reliable kind; the foreign oil being often the produce of the Matricaria above mentioned.

**Properties.**—Aromatic and stomachic. A tonic to digestion, without producing depression. Useful in habitual dyspepsia. Externally, as an emollient, and as a poultice to alleviate the pain and promote the suppuration of abscesses.

**Preparations.**—Extractum Anthemidis, 48 from 112. Dose, 2 to 10 grains. Infusum. Anthemidis, 1 in 20 Dose, 1 to 4 fluid ozs.

The dose of the oil is 2 to 5 minims, prescribed as an adjunct to cathartic medicines, to check griping, &c.

**No. 15.**—Case B. 34.—**Bearberry Leaves.**—The dried leaves of Arctostaphylos Uva Ursi, *Ericaceæ*, collected in September or October from indigenous plants. The Student will take note of the obovate, entire coriaceous, and shining leaves, which are reticulated on the under surface. As these may be confused with Buchu leaves, (which see), it will be well to compare the two. It must be particularly borne in mind, that the leaves have no dots on the under surface, and that the margin is not toothed. The infusion of bearberry leaves should give a blackened precipitate with Ferric Chloride. Box Leaves and Red Whortleberry (*Vaccinium Vitis Idæa*) are frequently mixed with the above, and should be well examined.

**Composition.**—Tannic acid, 36 per cent., and Gallic acid 1·5 per cent. It is to these acids that the leaves owe their astringency. A resin, volatile oil, and some extractive matters are also obtained.

**Properties and Uses.**—Astringent, tonic and diuretic; acting principally upon the urinary organs. Chiefly given in chronic catarrh of the bladder, but must be used for some time before any great benefit is experienced. Used also in Leucorrhœa and Diabetes. They have been employed as an antidote in poisoning by Ipecacuanha.

**Preparations.**—Infusum Uvæ Ursi, ½ to 10 oz. Dose, 1 to 2 fluid ounces.

**No. 16.**—Case B. 40.—**Buchu Leaves.**—Barosma Betulina *Rutaceæ.*

**No. 17.**—Case B. 39.—Barosma Serratifolia ,,

**No. 18.**—Case B. 41.— ,, Crenulata ,,

The dried leaves. Imported from the Cape of Good Hope. The Student will mark well the difference in form, size, and margin of the above varieties of leaves.

**Composition.**—The active principle is a volatile oil and a bitter principle called barosmin. The latter is insoluble in alcohol and ether, but freely soluble in water.

**Properties and Uses.**—Its use is similar to that of Uva Ursi. It possesses stimulant, diuretic and diaphoretic properties, acting specially upon the urinary organs, and is consequently of great benefit in gleet and stricture. In gout, dropsy, and catarrh of the bladder, it is acknowledged to be of service. Dose of powdered leaves, from 20 to 30 grains, in wine.

**Preparations.**—Infusum Buchu, ½ oz. to 10 oz. Dose, 1 to 2 fluid ozs. Tinctura Buchu, 1 in 8. Dose, 1 to 2 fluid drachms.

# DRAWER E.

## ROOTS, &c.

**No. 1.**—Case A. No. 5.—**Scammony Root.** — The dried root of Convolvulus Scammonia—*Convolvulaceæ.* From Syria und Asia Minor. The milky juice of the living root is Scammonium, *B.P.*, while from the dried root, Resina Scammoniæ is extracted by spirit. Scammony root is most abundant in resin just before the plant flowers.

**Composition.**—Good scammony root contains about 4 per cent. of resin, 6 per cent. of gum, and 25 per cent. of extractive matter, sugar, and starch, the remainder being woody fibre and mineral matter. When the powdered root is shaken up with ether, and the solution obtained is evaporated; it leaves a residue of resin of scammony.

**Properties.**—See No. 13.—Drawer B.

**Preparation.** — Resina Scammoniæ. Dose, 3 to 10 grains, best in emulsion, with milk, as Mistura Scammonii.

**No. 2.—East India Rhubarb.**—The dried root of Rheum Officinale, *Polygonaceæ.* It was formerly considered to be the produce of Rheum Palmatum, and is grown in Chinese Tartary and Thibet, where it is deprived of its cortical portion, and imported from Canton or Shanghai to the East Indies, and thence transhipped to England. It is called in commerce "half-trimmed" rhubarb.

**No. 3.—Batavian Rhubarb.**—This is called "Dutch trimmed" rhubarb, and will be noticed to be in flattish pieces, prepared in imitation of the so-called Turkey rhubarb.

**No. 4.—English Rhubarb.**—Is the root of Rheum Rhaponticum cultivated in England at Banbury in Oxfordshire, and elsewhere. It is a very inferior quality, containing a larger quantity of starch and fewer raphides than the official rhubarbs above mentioned, but it is yet very much sold for genuine rhubarb in this country.

**In Case C. No. 4,** is a specimen of Russian rhubarb, the much-esteemed so-called Turkey rhubarb of former times. It was originally imported into Europe through Turkey, and thus acquired its name; but subsequently it was brought from Tartary and Thibet, by way of Moscow. This is the highest quality of rhubarb, but is now seldom or never met with in commerce. The Student will observe that there are two varieties, called respectively "rounds" and "flats." He will also notice the peculiar colour and arrangement of the veins and its marked freedom from impurities.

Powdered rhubarb is said to be frequently adulterated with starch and turmeric. Both of these may be detected by means of the microscope, and the latter may also be specially tested for by moistening a suspected sample with solution of Boracic acid, then drying at a gentle heat; when, if turmeric be present, a *deep red* colour is produced.

**Composition.**—Rhubarb contains a yellow crystalline principle, called *chrysophanic acid*, $C_{10} H_8 O_3$. It is sparingly soluble in water, but freely in alkalies, yielding with Caustic Potash a *red* colour, which, in evaporating the solution to dryness, turns first *violet*, and finally *blue*. Besides this principle, rhubarb contains three resins respectively coloured, *red*, *brown*, and *black*, soluble in alcohol and caustic alkalies. In the red resins, Tannic and Gallic acids may also be detected, and the root is also very rich

in raphides of Calcic Oxalate. The remaining constituents are starch and a small trace of volatile oil, which gives to rhubarb its characteristic odour.

**Properties.**—Mild purgative, tonic and astringent. It slowly empties the bowels, and afterwards acts as an astringent to confine them. Owing to this secondary action, it is exhibited in the first stage of diarrhœa, but it ought not to be given for constipation, unless combined with other purgatives. The dose, in powder, as a stomachic, is 1 to 5 grains, and as a purgative 10 to 30 grains. The most useful way to administer rhubarb with the latter object is, however, undoubtedly in the form of Pulv. Rhei. Co., (Gregory's powder), stirred up in water with a little Aromatic Spirits of Ammonia.

**Preparations.**—Extractum Rhei. Dose, 5 to 15 grs.
Infusum ,, 1 in 40. ,, 1 to 2 drms.
Pil. Rhei. Co. 1 in 4 nearly ,, 5 to 10 grs.
Syrupus. Rhei. 1 to 4 drms.
Vinum ,, 1½ oz. to 1 pt. 1 to 2 ,,

Also, Pulv. Rhei. Co. 1 in 4½, children's dose, 5 to 10 grains; adult dose, 20 to 60 grains: and Tinctura Rhei, dose as a stomachic 1 to 2 drachms, as a purgative, ½ to 1 ounce.

**No. 5.**—Case A. No. 1.—**Rhatany Root.**—The dried root of Krameria Triandra.—*Polygalaceæ.* Imported from Peru. There are two varieties, (1.) Peruvian Rhatany, and (2.) New Granada or Savanilla Rhatany, the latter being now considered the preferable variety. The Student will observe the difference in feel, colour and tenacity of the cortical portion.

**Composition.**—Tannic Acid, 40 per cent., with a trace of Gallic acid, and a characteristic acid called Krameric acid, which has not been thoroughly investigated.

**Properties.**—A powerful astringent, useful in dysentery with hemorrhage, and as an injection in numerous discharges, such as Leucorrhœa. It is also a constituent of most astringent dentifrices.

**Preparations.**—Extractum Krameriæ, 5 to 10 grains.
Infusum ,, 1 in 40; ½ to 2 ozs.
Tinctura ,, 1 in 8; ½ to 2 drs.
It is also contained in Pulv. Catechu. Co.

**No. 6.—Belladonna Root.**—The dried root of Atropa Belladonna, *Atropaceæ*. Cultivated in England, but more commonly imported from Germany. The Student should examine this root, side by side with Gentian, for which a careless observer might be apt to mistake it, with disastrous results.

**Composition.**—The active principle is an alkaloid called *Atropia*, $C_{17}H_{23}NO_3$, which exists in the root as a soluble *acid malate*. It is slightly soluble in water, but more so in Alcohol, Ether and Chloroform. Its solutions have a faint alkaline reaction, and it is very readily decomposed by exposure to the air in contact with alkalies. It gives a *yellow* precipitate with Auric Chloride, and a *white* precipitate with Tincture of Galls. Two pounds of the root will yield about 40 grains of the alkaloid, when extracted by the B.P. process.

**Properties.**—A powerful narcotic, having also diaphoretic and diuretic properties. Given to relieve muscular spasms and irritability; also employed in spasmodic stricture, in neuralgia, convulsions and rheumatism. The smallest quantity of the Tincture, or of a solution of Atropia, introduced into the eye, powerfully dilates the pupil. In a poisonous dose, it causes dimness of sight, giddiness, delirium, followed by numbness, aphonia and death.

*Antidotes.*—Remove the poison by evacuants and give vegetable acids, astringents and green tea. Opium has been stated to be an antidote, and its efficacy has also been denied. The dose of Atropia, is from $\frac{1}{50}$ of a grain, carefully increased. It is best exhibited in solution, or in pills with powdered liquorice and honey. Hypodermic injections have also been employed, commencing with $\frac{1}{100}$ of a grain. The action of Atropia, however, should be most carefully watched during its administration. Its preparations are, Liquor Atropiæ, 1 in 120, each drachm of which contains $\frac{1}{2}$ a grain, but it soon decomposes by keeping. The dose should commence with 1 minim. Liquor Atropiæ Sulphatis, 4 grains to the ounce. Dose 1 to 2 minims. Ungentum Atropiæ, 1 in 60, not more than 30 grains of which should be used for each application.

**Preparations.**—Extractum Belladonnæ, 4 from 100, dose $\frac{1}{4}$ to $\frac{1}{2}$ grain. Tinctura Belladonnæ, 1 in 20, dose 5 to 20 minims. Emplastrum Belladonnæ, 3 of Ext. yields $3\frac{1}{2}$ of plaister. Uugentum Belladonnæ, 1 in $5\frac{1}{2}$.

**No. 7.—Gentian Root.**—The dried root of Gentiana Lutea, *Gentianaceæ*, collected and dried principally in Switzerland and other mountainous districts of Central and Southern Europe, and usually imported by way of Havre or other French ports. As Gentian is often mixed with the roots of allied plants, such as *Gentiana purpurea*, &c., the Student ought to observe carefully the distinctive markings of the true gentian, and then contrast it with the adulterations also to be seen in this compartment. The medicinal properties of these adulterations are, however, very similar, although inferior, to those of true Gentian.

**Composition.**—It contains Gentisic Acid. A bitter crystalline pale yellow body slightly soluble in water, more

so in alcohol, and unites with alkalies to form salts. Its solutions are not affected by any salts of heavy metals, except those of copper or iron. Besides this acid, there is another bitter principle called Gentianite (not yet definitely studied) as well as Pectin (vegetable jelly) sugar gum, waxy and colouring matters, and woody fibre. Owing to the sugar, a decoction of gentian is susceptible of fermentation with yeast, and yields an intoxicating beverage, much used in Switzerland. The odour of Gentian is due to an oily volatile matter.

**Properties.**—Tonic and Stomachic, useful in all cases of debility, either from chronic disease or other cause. It is a *bitter tonic,* pure and simple, without any stimulating aromatic principle.

**Preparations:—**

| | | | |
|---|---|---|---|
| Tinct. Gentianæ Co. | 1 in 13⅓. | Dose, | 1 to 2 drachms. |
| Infus. ,, ,, | 1 in 80. | ,, | 1 to 20 ozs. |
| Mist. ,, | | | ½ to 1 oz. |
| Ext. ,, | | | 10 to 15 grs. |

**No. 8.—Dandelion Root.**—The dried root of Taraxacum Dens Leonis—*Compositæ.* May be collected at any time between the months of September and February, except during or immediately after frost. In the collection of this root, uninformed people are often apt to gather the roots of other composite plants, *(Autumn Hawkbit, Chicory,* &c.*)* The Student should therefore specially note the appearance of a section, with its very evident Meditullium and general annular structure. In examining the whole plant, the Student will notice (1) the radical leaves, simple and pinnatisected with runcinate margin. (2) The capitulum of yellow ligulate florets, terminal upon a scape, perfectly unbranched, and destitute of bracts.

**Composition.**—The active principle of the milky juice is *Taraxacin* or *Dandelion bitter*, soluble in ether, alcohol, and boiling water, but not so freely in cold water. The root also contains sugar, gum, caoutchouc, wax, &c., but other substances are suspected, which have not been yet fully determined. In the autumn it is richer in the active constituents.

**Properties.**—Alterative and diuretic, and is considered to be beneficial in obstructions of the liver, jaundice, dyspepsia, &c. It is given with purgatives in dropsy, when suspected to originate from the obstructions above referred to.

**Preparations:—**

| | | | |
|---|---|---|---|
| Ext. Taraxaci | (fresh root) | dose | 5 to 30 grains. |
| Decoct. ,, | 1 in 20 | ,, | 2 to 4 ozs. |
| Succus ,, | 3 in 4 (fresh root) | | 1 to 2 drachms. |

**No. 9.—Pellitory Root.**—The dried root of Anacyclus Pyrethrum, *Compositæ*. A native of Spain, but growing also in Barbary, and imported from the Levant. The Student will compare a section of this root with one of Dandelion, and notice its radiating structure as contrasted with the annulated nature of the latter.

**Composition.**—The acrid resinous principle is called *Pyrethrin*, and it also contains tannin and an acrid oil.

**Properties.**—Irritant and sialagogue, causing when chewed, a prickling sensation in the mouth. Used as a masticatory in toothache, and as a gargle in relaxed throat.

**Preparation.**—Tinctura Pyrethri, 1 in 5, never given internally.

**No. 10.—Aconite Root.**—The dried root of Aconitum Napellus, *Ranunculaceæ*. Obtained from plants cultivated in Britain, but more commonly imported from Germany, and collected in autumn or early spring. It is most important that the Student should carefully examine Aconite Root, as it has often been pulled up and eaten for horse-radish with fatal results. Aconite will be noticed to be very conical or fusiform, while horse-radish is cylindrical, and the coffee-coloured exterior of the former and odour of the latter should also be noted. If a fresh root be scraped, the former will turn pink, and the latter will not be affected by exposure to the air. All Aconites are not equal in strength to the official *napellus*, for we find the A. *Ferox* (an Indian variety) with three times the quantity of Aconitia, and on the other hand we have A. *Heterophyllium*, another Indian variety, destitute of poisonous properties.

**Composition.** — The active principle is an alkaloid, called Aconitia $C_{30}$ $H_{47}$ $NO_7$ which is a white amorphous solid, existing in the root in combination with Aconitic Acid. There is also another alkaloid often present, called Aconella, which is not nearly so active, and by being precipitated along with the Aconitia during the extraction of the latter, a great variation is caused in the strength of the commercial samples of that alkaloid. Aconitia is soluble in water and ether, but only very slightly in alcohol. When the slightest quantity is applied to the skin it causes numbness, preceded by a tingling sensation. It communicates a very characteristic violet tint to syrupy Phosphoric Acid.

**Properties.**—Aconitia is a very active poison, causing paralysis of the muscles, and then acting as a sedative and

killing by asphyxia. $\frac{1}{10}$ of a grain has been stated to be a fatal dose. The Antidotes are prompt vomiting, followed by stimulants and sinapisms to the spine. Some have recommended animal charcoal as an antidote. Aconitia is never given internally, but the preparations of Aconite are used as anodyne and diuretic. They are very useful agents for the relief of sciatica, neuralgia, and other acute nervous pains, and have also been employed to lessen the violence of the action of the heart in hypertrophy, and the expectoration in phthisis. They are, however, unfortunately uncertain in effect. Externally, the liniment is used to relieve neuralgia and rheumatism.

**Preparations.**—Liniment. Aconiti, 1 in 1
Tinct. Aconiti, 1 in 8, dose, 5 to 15 m.
Also Aconitia in Ungt. Aconitiæ, 8 gr. to 1 oz.

**No. 11.**—Case A. 23.—**Pareira Root.** — The dried root of Cissampelos Pareira, *Menispermaceæ*. Imported from Brazil. Although this is the official Pareira, and so named in the *B.P.*, it has been ascertained that it is not the true Cissampelos, but some other variety of the same species. (The true Pareira is shown as a curiosity in No. 12 (Case A. 16) and is easily recognised by its marked medullary rays, &c.) The Student will observe the peculiar structure and concentric, but oftener eccentric rings. This is important, as it is often adulterated with the stem (Case C. No. 5) which is known by its concentric rings, lichen-marks, &c., and should be carefully compared with the root.

**Composition.** — It contains a bitter principle, some Potassium Nitrate, and a yellow crystalline Alkaloid called *Cissampelia*. The latter is the active principle, and is analagous to Beberia (see Bebeeru bark,)

**Properties.**—Tonic and diuretic, chiefly prescribed in catarrh of the bladder, together with an acid or an alkali, as indicated by analysis of the urine.

**Preparations.**—Ext. Pareiræ, dose, 5 to 20 grains.
Ext. Pareiræ liq. ½ to 1 dr.
Decoct. Pareiræ, 1 in 13⅓, 1 to 2 oz.

**No. 13.**—(Case A. 14.)—**Podophyllin.**—The dried rhizome and rootlets of Podophyllum Peltatum, *Ranunculaceæ.* It is a very common plant in the United States of America, where it receives the name of *May Apple* and *Mandrake,* and is imported from thence to this country. The Student will observe the nature of this rhizome, and note the different scars; (*a*) where the rootlets have broken off, and (*b*) where the above-ground portion of the plant has been developed.

**Composition.**—The active portion is the resinous matter extracted by alcohol, and official in the *B.P.* On examination, this is found to consist of the active resin, soluble in ether, and an inactive one insoluble in that fluid. The only use of the rhizome is to prepare the Resina Podophylli, which is seen in Case C. No. 6. It is soluble in alcohol and liquor ammoniæ, and it is reprecipitable from the former by water, and from the latter by acids.

**Properties.**—Powerfully cathartic, acting rapidly upon the liver, and producing bilious evacuations. It is never prescribed *per se,* but always with colocynth, aloes, or some other purgative. From the similarity of its action to that of calomel, it has been called the "vegetable mercury."

The dose of the *Resina* is from ½ to 1 grain.

**No. 14.—Hemidesmus Root.**—The dried root of Hemidesmus indicus—*Asclepiadaceæ*—imported from India,

and commonly known as Indian Sarsaparilla, on account of its being formerly substituted for the true article. The Student will do well to compare it with Sarsaparilla, and observe its deep circular cracks, &c.

**Composition.** — Its active principle, which may be extracted by boiling water, is *hemidesmic acid.* It is volatile and crystallisable, but has not been properly studied.

**Properties.**—It was formerly supposed to be similar in action to Sarsaparilla, but is now rarely used, and is only official in the form of Syrupus Hemidesmi (1 in 8) dose, 1 to 4 fluid drachms, but usually employed simply as a flavouring.

**No. 15.**—Case A. 29. — **Ipecacuanha Root.**—The dried root of Cephaelis Ipecacuanha, *Cinchonaceæ.* Grown in Brazil, and imported in bales *via* Rio Janeiro.

Three varieties are recognised respectively, brown, red and grey. They are often found in the same bale, and are all the produce of the one plant, the difference in colour being only produced by the nature of the mode of drying. The Student will observe that the *true* Ipecacuanha is an *annulated* root, consisting of a *cortical portion* in which the active principle exists, and a woody *meditullium.* Good samples of Ipecacuanha should yield 80 per cent. cortical portion, and 20 per cent. meditullium. Two *false* Ipecacuanhas are found in commerce, which the Student should learn to distinguish. (1.) Psycotria Emetica, Striated or Peruvian Ipecacuanha. In contorted pieces, having deep annular fissures extending down to the meditullium, and laying it bare. (2.) Richardsonia Scabra, Brazilian undulated Ipecacuanha. A distinctly undulated

root with a starchy fracture. These varieties are both inferior in activity to the *true* Ipecacuanha.

**Composition.**—*Cephaelic Acid* (analagous to Catechuic Acid) a little volatile oil, gum, starch, fatty matter, and an alkaloid called *Emetina*. This is a dirty yellow amorphous powder, of which good Ipecacuanha yields about 1 per cent. It is soluble in alcohol, very slightly so in hot water, and still less in ether. It resembles Morphia in giving a *white* precipitate with Tannic Acid, but it is *not* coloured blue by Ferric Chloride.

**Properties.** — In small doses expectorant and diaphoretic, in large doses an emetic. It is not so rapid in action, but it is less depressing than Tartar Emetic, and it has also less tendency to be laxative. As a diaphoretic, it is given combined with opium, in the form of Pulv. Ipecac. Co. (Dover's powder). The dose in powder, as an expectorant, is ½ to 2 grains; as an emetic, 15 to 30 grains.

**Preparations:—**

| | |
|---|---|
| Pulv. Ipecac. Co. 1 in 10. | Dose 5 to 10 grs. |
| Trochisi Ipecac. ¼ gr. in each. | ,, 1 to 3 lozenges. |
| ,, ,, et Morphiæ, $\frac{1}{12}$ gr. in each. | ,, 1 to 6 ,, |
| Vinum ,, 1 in 20 | |
| (as expectorant) | ,, 5 to 40 minims. |
| (as emetic) | ,, 3 to 6 drachms. |

The Compound Powder, in turn, enters into Pil. Ipecac. cum Scilla 3 in 7. Dose, 5 to 10 grains.

**No. 17.**—Case B. 31.—**Jalap Root.**—The dried tubercules of Exogonium purga, *Convolvulaceæ*. Imported from Mexico, and known as Vera Cruz Jalap. The Student will carefully notice the shape of *true* Jalap, so as to be able to distinguish it from the *false* Jalap next described.

**Composition.**—Contains from 15 to 20 per cent. of resinous matter, with starch, sugar, and extractive matter. The resinous matter contains two glucosides, called respectively *Jalapin* and *Convolvulin*. Jalap resin is insoluble in turpentine, and *nearly so* in ether, and becomes slowly coloured by strong Sulphuric Acid.

**Properties.**—Brisk Cathartic producing watery stools, similar in action to Scammony, although less irritant. It is a favourite purgative for children, and is also useful as a vermifuge in young persons. It should be administered combined with substances calculated to allay griping.

**Preparations**:—

| | | |
|---|---|---|
| Extractum. Jalapæ. | 50 from 100. | Dose 5 to 15 grains. |
| Pulv. ,, Co. | 1 in 3. | ,, 20 to 60 ,, |
| Tinctura. Jalapæ | 1 in 8. | ,, ½ to 2 drachms, |

and the Resina Jalapæ extracted by spirit, 2 to 5 grains.

**No. 18.—Tampico Jalap.**—The dried tubercules of Ipomæa simulans, *Convolvulaceæ*. Imported from Tampico in the Gulf of Mexico. This is a common substitute for *true* Jalap, and the Student will observe its difference in weight and shape, &c.

## DRAWER F.

### BARKS, &c.

**No. 1.**—Case A. 12.—**Oak Bark.**—The dried bark of the young branches of Quercus Pedunculata, *Cupuliferæ*. Collected in spring from the common oak. Indigenous.

It will be observed that only the young bark is official, and therefore samples which are externally cracked and wrinkled, or which are unusually thick, should be rejected as too old.

**Composition.**—Tannic Acid and Gallic Acid, which are the active principles, together with *Pectin*, &c.

**Properties.**—Astringent, usually employed externally.

**Preparation.**—Decoctum Quercus, 1 in 16. Dose 1 to 2 ounces.

**No. 2.—Winter's Bark.**—Non official. The bark of Drymis Winteri, *Magnoliaceæ*. Originally found at the Straits of Magellan, but also imported from Peru and New Granada. The Student should compare this bark with that of Canella Alba, as the one is sometimes substituted for the other.

**Composition.**—A little volatile oil, resin, and Tannic acid, the latter constituent distinguishing it from Canella, which is not astringent.

**Properties.**—An aromatic tonic, formerly administered in scurvy. Dose in powder, ½ to 1 drachm, or an equivalent quantity infused in water.

**No. 3.—Bebeeru Bark.** — The bark of Nectandra Rodiæi, *Lauraceæ*. Imported from British Guiana.

Used only for the extraction of its active principle *Beberia*, which is a *yellow* resinous alkaloid, soluble in alcohol, and uniting with acids to form salts. The official salt is Beberiæ Sulphas, $C_{35}H_{40}N_2O_6H_2SO_4$, which is in thin dark brown translucent scales, with a strong bitter taste; soluble in water and spirit.

**Properties.**—Beberiæ Sulphas was originally intended as a substitute for Quinine, but no definitely good results have been obtained. Dose, 1 to 3 grains as a tonic, 5 to 10 grains as an antiperiodic.

**No. 4.—Elm Bark.**—The dried inner bark of Ulmus campestris, Ulmaceæ. Indigenous, and cultivated in Britain.

**Composition.**—Much gum, with a little Tannic Acid, and a peculiar dark substance, called *Ulmin.*

**Properties.** — Demulcent, alterative, and slightly tonic and astringent. Much recommended in eruptive diseases of the skin.

**Preparation.**— Decoctum Ulmi, 1 in 8. Dose, 2 to 4 fluid ounces.

**No. 5.—Cusparia Bark.**—The bark of Galipea Cusparia, *Rutaceæ.* Imported from tropical South America, and also called Angustura Bark. (See Case A. 11.)

The Student should be particular in examining this bark, and should notice its peculiar edges, and its inner surface capable of being split into laminæ, as a dangerous mistake might arise between it and the bark of Strychnos Nux Vomica (No. 15). When a drop of Nitric Acid is placed on the inner surface of Cusparia it only produces a *dark reddish* colour, while the same test applied to Nux Vomica immediately developes the characteristic *bright red* colour caused by the presence of *Brucia.*

**Composition.**—A volatile oil, a hard and a soft resin, (the latter coloured *dark red* by Nitric Acid) and a neutral bitter principle called *Cusparin*, soluble in alcohol, acids, &c., and rendered *greenish* by Nitric Acid.

**Properties.**—Stimulant and tonic. In hot climates, it seems to be somewhat antiperiodic, as it has been employed with success in fevers of a malignant or intermittent type.

**Preparation.**—Infusum Cuspariæ, 1 in 20. Dose, 1 to 2 ounces.

**No. 6.—Canella Bark.**—The bark of Canella alba—*Canellaceæ.* A native of, and imported from, the West Indies. To be carefully contrasted with the Winter's Bark already mentioned.

**Composition.**—A resin and bitter extractive matter, together with a little volatile oil and mannite, but no tannic acid or other astringent matter.

**Properties.** — Aromatic bitter, tonic and stomachic. Only now official as an ingredient in *Vinum Rhei,* but formerly official as a powder with aloes (still much sought after by old-fashioned country people as *Hiera Picra*). Dose in powder, to ½ a drachm.

**No. 7.**—(Case A. 6.)—**Yellow Cinchona Bark.**—The bark of Cinchona Calisaya, *Cinchonaceæ,* collected in Bolivia and Southern Peru. This bark is usually imported in *serons* (hide parcels), and is of two varieties: (1.) *Quill Yellow Bark* (Case C. No. 7); and (2.) *Flat Yellow Bark* (Case A. 7). The Student should carefully remark the characteristic fracture, short fibre, &c., so as to be able to detect the true from the spurious barks.

**Composition.**—A number of alkaloids, the chief of which are *Quina, Cinchonia,* and *Quinidia,* in combination with *kinic acid* and *kinovic acids, cinchona red, qunio tannic acid,* and a little *volatile oil.* The activity of the barks is produced by the alkaloids, and principally by the quina. (1.) Quina $C_{20}H_{24}N_2O_2$ is inodorous, very bitter, fusible about 300°, and very slightly soluble in water, more so in alcohol and in ether. It is precipitated from its solutions by alkalies, and is soluble in acids, forming solutions possessing the peculiar property of so altering the refrangibility of the actinic rays of light, as to render them visible as a blue *fluorescence.* Treated with Chlorine water and

liquor Ammoniæ it yields a green colour, and if potassium ferrocyanide be added before the ammonia a deep red is produced. When *nearly, but not quite,* dissolved, in very dilute sulphuric acid, it yields the *B.P.* neutral sulphate —Quinæ Sulphas $(C_{20}H_{24}N_2O_2)_2 H_2SO_4 7 H_2O$—which is very difficultly soluble in water, but freely in dilute sulphuric acid, forming the acid sulphate $C_{20}H_{24}N_2O_2H_2SO_4 7H_2O$. The dose is 1 to 10 grains. (2,) *Cinchonia* $C_{20}H_{24}N_2O$, is distinguished from Quina by being insoluble in ether. With Chlorine water and liquor ammoniæ it gives a yellowish white precipitate. Its neutral sulphate is very much more soluble in water than that of Quina, and they can therefore be separated when together in solution, by evaporation till a slight pellicle forms on the surface, and allowing to cool, when the Quina sulphate crystallizes out, leaving the cinchonia in solution. (3.) *Quinidia* $C_{20}H_{24}N_2O_2$ is simply a modification of Quina, not so soluble in ether as that alkaloid. (4.) *Cinchona red* is of two varieties, one soluble in cold water, and closely allied to tannic acid, and the other insoluble, but dissolved by acids and alkalies. The *B.P.* states that this bark should yield at least 2 per cent. of Quina.

**Properties.**—Antiperiodic, tonic, and astringent. Administered in all kinds of intermittent fevers and intermittent neuralgic affections. The doses of the bark, or quinine, should always be taken *in the interval between the paroxysms,* and never while the fit is on. Either a full dose may be administered just before the expected return of the paroxysm, or a series of small and separate doses may be kept up during the whole time of intermission. *As a tonic,* it is useful in all cases of convalescence from acute diseases, in dyspepsia, scrofula, &c., and as an

*astringent* and *antiseptic* it is employed in gargles, &c. Dose of bark as a tonic, 15 grains, as an antiperiodic 1 to 2 drachms.

**Adulterations or Substitutions.**—These are most commonly as follows, and should be carefully examined and compared with the true bark.

C. Scrobiculata (flimsy bark.)
C. Rufinervis (mulberry carabaya bark.)
C. Josephina.
C. Boliviana (Bolivian Calisaya.)

**Preparations:—**

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| Extract. Cinchon. Liq. | 1 from 4. | Dose, | 10 to 30 minims. |
| Decoct. Cinchonæ | 1 in 16 | ,, | 1 to 2 ozs. |
| Infus. Cinchonæ | 1 in 20 | ,, | 1 to 2 ozs. |
| Tinct. Cinchonæ | 1 in 5 | ,, | 1 to 2 drachms. |

**No. 8.**—(Case A. 9.)—**Pale Cinchona Bark.** — The bark of Cinchona Condaminea, *Cinchonaceæ*, collected in the neighbourhood of Loxa, in Ecuador.

There are several varieties. (1) *Fine Crown Bark* (Case A. 9.) (2) *Rusty Crowm Bark* (Case C. ) (3) *Red Crown Bark* (Case C. .) (4) *H. O. Crown* (also in No. 8.) All these varieties ought to be carefully noticed.

**Composition.**—Chiefly Cinchonia and Quinidia, and very rarely a little Quina. The *B.P.* states that the mixed alkaloids should amount to 1 per cent.

**Properties.**—As yellow bark, but not so rich in antiperiodic properties, although more astringent, owing to its coutaining more quino-tannic acid. Dose, 10 to 60 grains.

**Preparations.**—Tinct. Cinchonæ Co. 1 in 10. Dose, ½ to 2 drs., and also Mistura Ferri Aromatica.

**No. 9.**—(Case A. 2.)—**Red Cinchona Bark.**—The bark of Cinchona succirubra, *Cinchonaceæ*, collected on the western slopes of the Chimborazo. Sometimes in quills, but more commonly in the characteristic dark reddish flat pieces.

**Composition.**—As yellow bark, but chiefly Quina and Cinchonia. It has been stated by some to be equal to yellow, but it is generally considered not so rich in alkaloids. The *B.P.* gives as the standard 2 per cent. of mixed alkaloids, but fine varieties will yield 2·5 Quina, and 1·5 Cinchonia.

**Properties.**—As yellow bark, and by many much esteemed.

**No. 10.—Cinchona Lancifolia Bark.**—The bark of the Cinchona Lancifolia, *Cinchonaceæ*, from New Grenada, *via* Santa Fe and Carthagena. The varieties most common are (1) Quill, seen in this compartment; and (2) Flat Carthagena Bark (Case C. 8), which is liable to be mistaken for yellow cinchona, and is known by its long inner fibres, &c. These barks are only official for the purpose of making quinine, but the proportion of it is very variable.

**No. 11.—Cascarilla Bark.**—The bark of Croton Eluteria, *Euphorbiaceæ*, growing in the Bahama Islands, and usually imported from Nassau, in New Providence. The student should learn to carefully distinguish this bark from Pale Cinchona, which it at first sight much resembles. Good bark should be in distinct quills, and not in little fragments.

**Composition.**—A resin, bitter extractive matter, and a volatile oil; the latter having a specific gravity of ·93, and consisting of a non-oxygenated and an oxygenated

portion. When heated with Nitric Acid, it is converted into a *yellow* resin, with a characteristic odour.

**Properties.**—An eminently aromatic stimulant and tonic, but without astringency. It has been held to possess, in an inferior degree, the properties of Cinchona Bark. It is usually prescribed in dyspepsia, flatulent cholic, and general debility.

**Preparations.**—Infusum Cascarillæ, 1 in 20. Dose, 1 to 2 fluid ozs. Tinctura ,, 1 in 8; ½ to 2 drachms.

The infusion is rarely prescribed without a little of the Tincture to preserve it. The combination thus produced is an excellent vehicle for the administration of mineral acids.

**No. 12.—Simaruba Bark.**—Non official.—The dried root bark of Simaruba amara, *Simarubaceæ*. A native of South America, imported from Jamaica. Its active principle is *Quassin*, which will be fully described under Quassia. Its properties are tonic, and it may be employed as a substitute for that wood.

**No. 13.—Cassia Pods.**—The ripe fruit of Cassia Fistula, *Leguminosæ*. Imported from the East and West Indies. The Student will observe that the fruit is an *indehiscent lomentum*, with transverse spurious dissepiments. The best is the West Indian, and ought to be weighty, and should not rattle when shaken.

Cassia Braziliana (**No 14.**) or *Horse Cassia*, which is much used in veterinary practice, should be examined and compared with it.

**Composition.**—The useful portion is the pulp, which is a black, sticky matter, becoming sour on exposure to the air, owing to acetous fermentation. It contains gum, pectin, sugar, and a peculiar variety of Tannic Acid.

**Properties.**—Purgative, but as it has a great tendency to cause griping, it is generally given only as an ingredient in Confectio Sennæ.

**No. 15.—Nux Vomica Bark.**—Non official.—The dried bark of Strychnos Nux Vomica—*Loganiaceæ.* Imported from Coromandel. It is often substituted by mistake or intention for Cusparia Bark. The tests and points to be noted have been already referred to in considering that substance. Nux Vomica Bark differs from the Seeds in containing no Strychnia, but only Brucia.

**No. 16.**—(Case A. 28.)—**Wild Cherry Bark.**—Non official. The inner bark of Prunus virginiana, *Rosaceæ.* Imported from North America. It is shown here, as the Student at first sight might be led to mistake it for yellow Cinchona. It is official in America.

**Composition.** — Tannic and Gallic Acids, and also *Amygdalin.* When distilled, it yields a volatile oil and hydrocyanic acid, in a similar manner to Bitter Almonds.

**Properties.**—Tonic and arterial sedative. Used in heart disease.

**No. 17.—Pomegranate Bark.**—The dried bark of the root of Punica Granatum, *Myrtaceæ* (*Granateæ*) Imported from the South of Europe. The Student will observe its characteristic appearance, and also its great astringency, but entire want of bitterness. By this latter property it is distinguished from Barberry and Box, with which it is adulterated.

**Composition.**—About 20 per cent. of Tannic Acid, with a little Gallic acid, as well as resin, mannite, &c.

**Properties.**—Powerfully astringent, employed as an anthelmintic for the expulsion of Tænia. It is also some-

**Properties.**—Similar to Opium, but very uncertain in operation. The extract is said to allay pain, without producing the after effects of opium.

**Preparations**:—

Ext. Papaveris, Dose, 2 to 5 grains.

Syrupus Papaveris, 1 in 2½. Dose, 20 minims for children, and to 1 drachm for adults.

Decoct. Papaveris, 1 in 10.

**No. 2 and 3.—Galls.**—(No. 2, Common, and No. 3, best.)—Excrescences caused by the punctures and deposited ova of *Diplolepis Gallæ tinctoriæ* at the sides and ends of the young shoots of Quercus infectoria (the dyer's oak) *Cupuliferæ*. The female insect is provided with a sting, (ovipositer) with which she makes the puncture and deposits her egg. An excresence is quickly produced, in which the larva is formed, and when it arrives at maturity it eats its way out, leaving a small hole through which it has made its exit. The best galls are *Mosul Galls*, but the ordinary commercial variety is *Aleppo Galls*, which are imported from the Levant. There are two varieties, the *blue* and *white*, the former being the best. The Student will observe that the good galls are *bluish black*, heavy, and have no hole; while the commoner varieties are *light* coloured, and have a perforation through which the insect has passed. The smooth round galls in **No. 2** are the produce of English Oak, which are not nearly so valuable as the foreign article.

**Composition.**—From 30 to 40 per cent. of Tannic acid, about 3 per cent. of Gallic acid, and some extractive matter, &c. An infusion of galls is acid to test paper, yields a dirty white precipitate with gelatine, and an inky black with a Ferric salt.

**Properties.**—A powerful astringent, used in internal hemorrhages, such as Hæmaturia and Hæmoptysis, and also in Chronic Diarrhœa. Externally as a gargle, or as an injection in old standing mucous discharges, and in ointment for Hæmorrhoids. The Tincture has been recommended as an antidote for Alkaloids and Antimony Salts, owing to its producing insoluble Tannates.

**Preparations.**—Tinct. Gallæ, 1 in 8. Dose, ½ to 2 drs.
Unguent ,, 80 grs. to 1 oz.
,, ,, cum Opio, similar strength, with 32 grains of opium in each ounce.

**No. 4.—Capsicum.**—The dried ripe fruit of Capsicum fastigiatum, *Solanaceæ*. A native of Sierra Leone, imported from Zanzibar. The fruit, which is known in common as Guinea Pepper and Pod Pepper, is a membranous capsule. The Student will observe two varieties, the large and small, the latter being more esteemed.

The fruits of C. Annuum, which are the common *chillies* of commerce, were formerly official, but are not so now.

**Composition.**—An acrid resin and colouring matter, and an active volatile oleagenous principle, concreting on exposure to the air, called *Capsicin*. It is intensely hot to the tongue, readily soluble in alcohol, ether, and essential oils, and slightly so in water and vinegar.

**Properties.**—Stimulant and rubefacient. Employed in atonic dyspepsia, and externally as a gargle in scarlatina and malignant sore throats generally. A concentrated tincture, is a common application to chilblains. Dose in powder, according to the *B.P.*, is 1 grain in a pill with crumb of bread, but any quantity up to ½ drachm may be taken.

**Preparation.**—Tinctura Capsici, ¾ oz. to pint. Dose, 15 to 20 minims.

**No. 5.**—Case B. 57.—**White Mustard.**—The Seeds of Sinapis Alba. *Cruciferæ.* Indigenous.

**No. 6.**—(Case B. 56.—**Black Mustard.**—The seeds of Sinapis Nigra.—*Cruciferæ.* Indigenous.

**Composition.**—Both varieties contain from 25 to 35 per cent. of an inert fixed oil. The Black Mustard contains a peculiar ferment, called *Myrosin*, analagous to the emulsin of almonds, and it is also rich in *Potassium Myronate.* When the powder is moistened with water, the *Myrosin* acts upon the *Potassium Myronate*, and gives rise to the essential oil of mustard, which is Allyl Sulphocyanide, $C_3H_5CNS$. This action can only take place in the presence of water, and that is the reason why powdered mustard does not give off any irritating odour until moistened. White mustard does not contain Potassium Myronate, but it possesses a glucoside called *Sinalbin* (sulpho-sinapisin) and yields, when moistened, a little acrid principle, which is not, however, volatile. The most pungent powder is produced by a mixture of white and black mustard, as the Myrosin of the white, assists that of the black, in producing the essential oil. The essential oil of Mustard is nearly colourless, soluble in alcohol and ether, and a powerful vesicant when applied to the skin. Its specific gravity is 1·015, and it is slightly soluble in water.

**Properties.**—In small doses as a condiment, and an aid to digestion; in large doses an emetic. Externally as a rubefacient, its effects being more evanescent than those of Cantharides.

**Preparations.**—Cataplasma Sinapis, 2½ Mustard, and the same of Linseed Meal, in 10 of boiling water. Linimentum Sinapis Co. 1 in 40.

**No. 7.—Grains of Paradise.**—The Seeds of Amomum Melagueta, *Zingiberaceæ*. Imported in casks, &c., from the coast of Guinea.

**Composition.**—A volatile oil, two resins, extractive matter, starch, &c., &c.

**Properties.**—Aromatic, similar in action to pepper, and much esteemed in its native country.

**No. 8.**—(Case B.) 59.)—**Linseed.**—The seed of Linum usitatissimum, *Linaceæ*. Cultivated in Britain. The Student will particularly notice the appearance of these seeds, as in commerce they are largely adulterated.

**Composition.**—The kernel of the seed contains a fixed oil, which is separated by expression, and is the well-known Linseed Oil, employed by painters on account of its drying qualities. It is composed of oleate, stearate, and Palmitate of Glyceryl. The seeds yield by cold expression about 20 per cent. and by hot pressure somewhat over 30 per cent.

The testa contains a mucilaginous matter, partly soluble and partly insoluble in water, yielding a precipitate with Plumbic oxyacetate, but not affected by Iodine. It is usually more or less sour, and is therefore acid to test paper, (presence of Acetic Acid.)

**Properties.**—Demulcent and emollient. Used in the form of infusion, with beneficial effects in gonorrhœa, coughs, inflammation of the chest and bladder, as well as of the mucous membranes generally. It allays the irrita-

tion usually attendant on dry coughs. The meal, (which is the cake left after expression of the oil, and ground) forms the well-known Cataplasma.

**Preparations.**—Infusum Lini. 1 in 30. Dose, *ad. lib.* Cataplasma Lini, 4 ounces to 10 ounces of boiling water, ½ ounce of olive oil, the latter being added to supply the place of the natural oil removed by expression. A poultice made in this way is much less offensive in odour than one prepared from the bruised seeds, as the natural oil soon becomes rancid.

**No. 9.—Star Anise.**—The fruit of Illicium Anisatum, *Magnoliaceæ.* Grown in China and Japan.

The Student will observe the peculiar stellate arrangement of the carpels in this fruit. Its composition and properties are similar to those of the European Anise already referred to.

**No. 10.**—(Case A. 4.)—**Pimento.**—The dried unripe berries of Eugenia Pimenta, *Myrtaceæ.* Grown in the West Indies, and imported almost entirely from Jamaica. The Student will observe that this berry (called Allspice), is to be distinguished from black pepper by several marked characteristics, notably the apparent remains of the calyx. It should also be examined along with cubebs.

**Composition.**—The active principle is a volatile oil, together with green oil and tannin. The volatile oil is identical in all but odour, with that of cloves (which see). The green oil is also acrid, and forms a green solution with ether.

**Properties.**—Like cloves, aromatic and stimulant.

**Preparations**—Aquæ Pimentæ, 1 in 11½. Dose, 1 to 2 ozs.

**No. 11.**—(Case B. 32.)—**Ergot.**—The sclerotium (compact Mycelium, or spawn) of Claviceps purpurea, *Fungi.* Produced within the paleæ of Secale Cereale, *Graminaceæ.* The Student will note the peculiar bluish black colour of the rye grains. This is caused by the Ergot, which is a diseased state of the rye, induced by the deposit and germination of the spores of the fungus above named. The germs of the disease are at first apparent within the paleæ, or inner whorl of bracts of the rye flower, as a white collection of spores and filaments which form the *sphacelium,* or first stage of growth. After the whole surface of the ovary has been covered with spores, germination proceeds, and a second growth of *compact mycelium* is formed beneath the first coating. This second growth is called the *sclerotium,* and while it is going on, the first layer gradually decays, and the whole becoming darkened to the characteristic blue black of the ergot. At this stage further development ceases, because there is no soil from which the fungus can extract nourishment, but if the grain be placed in a little mould and properly treated, the regular fully developed fungi will arise from the mycelium, with all the characteristics (stipe, hymenium, pilæus, &c.) of ordinary mushrooms, only of course very minute in size.

Good Ergot should be fresh, because by keeping it is attacked by a little mite, which eats up the interior of the grain and reduces it to a shell. Ergot should always be preserved in closely stoppered bottles.

**Composition.**—There appear to be three principles. *Ergotin, Secalin,* and a *fixed oil.* Ergotin is a *reddish* substance, soluble in alcohol, but not in ether. Secalin is a volatile substance, supposed to be in combination with the

Ergotin. The first oil is extractable by ether, and was formerly considered as being active, but as it is now understood to be quite inactive, it is removed with ether before making the official extract. What the exact active principle of ergot is, has not been definitively proved, but it is evident that as it exists in the diseased grain it is soluble in water, and in very dilute spirit.

**Properties.**—It is administered in protracted labour, to increase the contractions of the uterus and so hasten delivery; or after the birth is complete, to aid in the expulsion of the placenta.

Dose in powder, 20 to 30 grains, given stirred up in water, or better infused in boiling water for 15 minutes, and the infusion taken unstrained.

**Preparations.** — Extractum Ergotæ Liquidum, 1 in 1.
Dose 10 to 30 minims.
Infusum Ergotæ, 1 in 40.
Dose, 1 to 2 fl. ozs.
Tinctura Ergotæ, 1 in 4.
Dose, 15 to 30 minims.

**No. 12.**—(Case B. 44.)—**Calabar Bean.**—The seed of Physostigma venenosum, *Leguminosæ.* Imported from Western Africa.

The Student will observe the elongated furrow, or hilum, with the micropyle visible at one end.

**Composition.** — The active principle is an alkaloid called *Physostigmia,* which exists chiefly in the kernel, and is extractable by alcohol, and more imperfectly by water. It is soluble in ether, and also in acids, forming with the latter *reddish* solutions.

**Properties.**—It powerfully contracts the pupil of the eye, diminishes the action of the heart, and also induces

paralysis through its action upon the spinal cord. It is chiefly used by oculists in *Presbyopia.* It has been recommended in Tetanus, Delirium Tremens, Epilepsy, and as an antidote for poisoning by Strychnia, but is a dangerously powerful medicine.

**Preparation.**—Extractum Physostigmatis. Dose, $\frac{1}{16}$ to $\frac{1}{4}$ grain.

**No. 12.—Stavesacre Seeds.**—Non official.—The seeds of Delphinium Staphysagria, *Ranunculaceæ.* Imported from the South of Europe.

Their triangular form can never be mistaken.

**Composition.**—The active principle is an alkaloid calle *Delphinia,* which gives a similar reaction to Digitalin with Sulphuric Acid and Bromine water. It is, however, not affected by the bile test (see Digitalis.)

**Properties.**—It has been sometimes administered as a vermifuge, but almost entirely used in the form of ointment in cases of itch, and to destroy pediculi.

**No. 14. —Cevadilla Fruits.**—The dried fruits of Asagræa officinalis, *Melanthaceæ,* inhabiting the Eastern slopes of the Mexican Andes, and imported from Brazil. The fruit is capsular, and consists of three carpels, called in some works on Materia Medica follicles, but wrongly so, as the fruits in the order are inferior, while the follicle is essentially a superior apocarpous fruit. The only use of Cevadilla is to prepare the alkaloid *Veratria,* which it contains in combination with *gallic or veratric acids. Veratria* $C_{32}H_{52}N_2O_8$ is prepared by the *B.P.* process in a state only somewhat approaching purity, ether and acids leaving a distinct trace of resinous matter undissolved. When brought in contact with the nostrils, it causes a violent fit

of sneezing. When treated with fuming sulphuric acid, it exhibits a play of colours, commencing with yellow and ending with violet. It is a powerful poison, very irritant, and subsequently acting on the heart. Given internally it acts as an emetic and drastic purgative, but it is rarely so administered, being reserved for outward application in neuralgia, swollen joints, &c. It should never be applied when the skin is broken, owing to the rapidity with which it would then be absorbed. Dose, $\frac{1}{16}$ of a gr.

**Preparation.** — Unguentum Veratriæ, 1 in 60, the alkaloid being first rubbed with olive oil before mixing with the lard.

**No. 15.**—(Case B. 46.)—**Areca Nut.**—Is the produce of Areca Catechu, *Palmaceæ*, from Southern India and Ceylon. It yields the Colombo Catechu already referred to. (See *Catechu.*)

**No. 16.**—(Case B. 47.)—**Cardamoms.**—The dried fruits of Elettaria cardamomum, *Zingiberaceæ*, from Malabar. The seeds are only official, and are to be separated from the pericarp before use. The decided three sided capsule is unmistakable when once seen, but the seeds themselves should also be examined, so as to know them separately if necessary. The Student will also notice three varieties, viz., "*shorts*," "*short-longs*," and "*long-longs*." The "*shorts*" are the best.

**Composition.**—The chief constituent is a volatile oil with a pleasant colour and hot taste. It spoils by keeping, becoming yellow, and parting with its odour. It is characterised by the extreme violence with which it decomposes oxidisers like Iodine and Nitric Acid, and is soluble in alcohol, oils, ether; and acetic acid; but insoluble in Liquor potassæ.

**Properties.**—A useful carminative, and added to purgatives to prevent griping. The tincture is often given as a "pick me up," to persons suffering from the effects of an overdose of alcohol.

**Preparations.** — Tinct. Cardamomi Co. 1 in 8. Dose, ½ to 2 dr. also an ingredient in Pulv. Cretæ Aromat., Pulv. Cinnam. Co., Tinct. Gentianæ Co., Tinct. Rhei., Ext. Coloc. Co. and Vinum Aloes.

**No. 17.**—(Case B. 13.)—**Colocynth.**—The dried decorticated fruit of Citrullus Colocynthis, *Cucurbitaceæ*. Imported from Smyrna, Trieste, France, and Spain.

The Student will observe two varieties: (1.) *Peeled Colocynth.* The larger and more pulpy samples are the *Turkey* article from Smyrna, Trieste, &c., and the smaller are the *Spanish*, or low quality. (2.) *Unpeeled Colocynth.* This kind comes from Mogadore, and is not official. 100 parts of good *Turkey* fruits yield about 28 per cent. of *pulp freed from the seeds*, which is the only part official. The entire fruit is an inferior syncarpos *pepo*.

**Composition.** — The active principle is a glucoside called *colocynthin*. It is soluble in water, bnt much more freely in alcohol, and insoluble in ether.

**Properties.**—In small doses it is an excellent purgative, especially in cases of long standing constipation; but in large doses, it is a powerful drastic hydragogue and catharic. It acts specifically upon the large intestine, and in large doses (100 grains) has proved fatal. It is useful in dropsy and uterine obstructions. Colocynth is prescribed with carminatives, to relieve the griping it is apt to cause; but the best combination is that of compound colocynth pill and extract of henbane, in which the latter effectually lessens the griping tendency and regulates the action.

**Preparations:—**

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|---|---|---|---|
| Extract. Coloc. Co., | 1½ in 6. | Dose, 2 to 5 | grains. |
| Pil. Coloc. Co., | 1 in 6. | ,, 5 to 10 | ,, |
| Pil. Coloc. et Hyoscyami | | ,, 5 to 10 | ,, |

In the latter pill there are 6 parts of Pil. Coloc. Co. to 3 of Ext. Hyosc.

**No. 18.**—Case B. 43.)—**Bael Fruit.**—The dried ripe fruit of Œgle Marmelos, *Aurantiaceæ*, from Malabar and Coromandel. This fruit may be mistaken for the Mangosteen fruit (*Garcinia Mangostana*), but the Student will notice the thicker rind of the latter than that of Bael, and the absence of adhering pulp and seeds, and by the remains of the stigmas on the readily separable epicarp. The true bael fruit is a *hesperidium*.

**Composition.**—A species of tannin, to which the fruit owes its astringency.

**Properties.** — Astringent. Used in dysentery and diarrhœa, but its efficacy is increased by combining it with other astringent medicines.

**Preparations.**—Extractum Belæ Liquidum. 1 in 1. Dose, ½ fl. drachm to ½ fl. oz.

## DRAWER H.—*Various.*

**No. 1.**—(Case A. 4.)—**Cinnamon.**—The inner bark of shoots from the truncated stocks of Cinnamomum Zeylanicum, *Lauraceæ*. Imported from Ceylon. The Student will notice that good cinnamom is pale in colour, and consists of several rolls of bark, one within the other. The *Ceylon cinnamon* is alone official, and is the best, while the Bombay or Tillicherry variety comes next, and the *Madras* last in value.

**Composition.**—A volatile oil, tannic acid, resinous matter, a little starch, &c. The volatile oil is principally Cinnamic Aldehyde (*cinnamyl hydride*) $C_9H_8O$. When exposed to the air it slowly absorbs oxygen, forming several resins and *cinnamic acid* $C_9H_8O_2$, but this reaction may be more rapidly effected by heating with potassium hydrate, when production of cinnamic acid takes place, (which unites with the potassium to form *cinnamate*), accompanied by the evolution of hydrogen. A cooled decoction of Cinnamon will not turn blue with iodine, on account of the presence of a body, (probably tannic acid), which decolorizes the Iodide of starch.

**Properties.**—Aromatic, stimulant, carminative, and slightly astringent. Employed to ease the griping of purgatives and also in flatulence, diarrhœa and uterine hemorrhage. Dose in powder, to 20 grains.

**Preparations**:—

| | |
|---|---|
| Aqua Cinnamomi, 1 in 8. | Dose, 1 to 2 ozs. |
| Oleum Cinnamomi, distilled oil. | ,, 1 to 4 min. |
| Pulv. ,, Co., 1 in 3 | ,, 3 to 10 grs. |
| Tinct. ,, 1 in 8 | ,, 1 to 2 drs. |

Also contained in

Acid, Sulph. Aromat.
Decoct, Hœmatoxyli.
Infus. Catechu.
Pulv. ,, Comp.
,, Cretæ Aromat.
,, Kino Comp.
Tinct. Catechu.
,, Cardam. Co.
,, Lavand. Co.
Vinum Opii.

**No. 2.**—(Case A. 15.)—**Cassia.**—The dried inner bark of Cinnamomum Cassia, *Lauraceæ.* Chiefly now imported direct from Canton, but sometimes *via* Calcutta, Singapore, &c. Its habitat is China, and it is therefore sometimes termed Chinese cinnamon, in commerce. It is to be carefully distinguished from cinnamom, chiefly by colour, and by being in single and not duplicated rolls.

**Composition.**—Like cinnamon, but inferior in the flavour, &c. of its volatile oil. A cooled decoction turns blue with Iodine, owing to the absence of the distributing element referred to under cinnamon. This test, therefore, serves to distinguish the two substances, but it is useless for a small admixture, as the addition of a little decoction of cinnamon will decolorize the blue produced with cassia and iodine.

**Properties.**—As Cinnamon, but coarse in flavour, and less esteemed. Dose of powder, 30 grains, and of oil to 3 minims.

**No. 3.**—(*a.*) **Orange Peel,** (*b.*) **Lemon Peel.**—The dried rinds of the ripe fruits respectively, of Citrus Bigaradia (bitter orange) and Citrus Limonum (lemon), *Aurantiaceæ.* From Southern Europe. They are easily distinguished, by their difference in colour and appearance. The fruit of both the orange and lemon is a hesperidium, and the rind (consisting of *epicarp* and *mesocarp* combined) is stripped off and dried; while the pulp of the lemon (containing the *eodocarp* in thin membranes running to the centre, and filled up between by a succulent development of the *placentas*) is used for extracting citric acid.

**Composition.**—The rinds contain a volatile oil and a bitter extractive matter, and the pulp contains citric acid,

$H_3C_6H_5O_7H_2O$. The lemon is the richer in this constituent, one table spoonful (4 drachms) of lemon juice, being usually considered as containing 16 grains of the acid.

**Properties.**—*Orange Peel* is viewed as a stomachic, carminative, and mild tonic. It is employed as an adjunct to infusions, &c., and its tincture is a common medium for the administration of Quinine and the mineral acids. A wine is prepared from oranges by fermentation, in this country. It usually contains about 10 per cent. of alcohol, and is official as Vinum Aurantii, for making Vin. Ferri Citratis, and Vin. Quinæ. *Lemon Peel* is an aromatic addition to stomachic medicines, especially in cases of dyspepsia. The *Oleum Limonis* is distilled or expressed, from the fresh rind. The process of expresssion is more common, but the oil obtained by distillation keeps better. It is usually imported from Italy, Portugal, or France. Its specific gravity is ·847, and it is somewhat soluble in rectified spirit. The dose is from 1 to 4 minims, and it is an ingredient of Spiritus Ammoniæ Aromat. and Liniment. Potassii Iodidi cum Sapone. *Lemon juice* is a refrigerant, and used in fevers as a cooling beverage. It is also given as an antiscorbutic, although the juice of the lime (*Citrus Limetta*) is more generally used for that purpose, being richer in citric acid. Lemon juice is also administered in rheumatism, and in combination with alkalies, to allay sickness. As the dispensing of an alkaline mixture to be taken with lemon juice or citric acid in a state of effervescence is a common occurrence, the proper quantities to be employed should be known, and the following table is therefore subjoined, avoiding fractions of a grain:—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 grs. Potass. Bicarb. | require | 14 grs. | Citric Acid | equal to | lemon juice, | 3½ | fl. drms. |
| ,, ,, Carb. | ,, | 17 | ,, | ,, | ,, | 4¼ | ,, |
| ,, Sodæ Bicarb. | ,, | 17 | ,, | ,, | ,, | 4¼ | ,, |
| ,, ,, Carb. | ,, | 10 | ,, | ,, | ,, | 2½ | ,, |
| ,, Ammon. Carb. | ,, | 24 | ,, | ,, | ,, | 6 | ,, |
| ,, Magnes. Carb. | ,, | 30 | ,, | ,, | ,, | 7½ | ,, |

**Preparations.**—(1) of *Orange Peel*:—

| | | |
|---|---|---|
| Infus. Aurantii. | 1 in 20. | Dose, 1 to 2 fl. oz. |
| Infus. Aurantii. Co., | 1 in 40. | ,, ,, ,, |
| Syrupus. Aurantii. | 1 in 8. | ,, 1 to 2 fl. dms. |
| Tinctura. Aurantii. | 1 in 10. | ,, ,, ,, |

(2) of *Lemon Peel*:—

Syrupus Limonis. 2 peel & 20 juice in 41. Dose, 1 to 2 fl drs.
Tinctura. Limonis, 1 in 8. ½ to 2 ,,
Orange Peel also enters into the Infusion, Mixture, and Tincture of Gentian.

The flowers of the *sweet orange*, Citrus Aurantium, are used as well as those of the bitter orange, for distilling with water, to produce *Aqua Aurantii floris*. This is prepared chiefly in France, and should be free from lead when tested with sulphuretted hydrogen. It is used in making Syrupus Aurantii floris, 8 in 4. Dose, 1 to 2 fluid drachms. It owes its action and odour to the volatile oil contained in the flowers, which is called in commerce *Oil of Neroli*.

**No. 4.**—(Case A. 8.)—**Liquorice Root.** — The root or underground stem of Glycyrrhiza glabra, *Leguminosæ*. Cultivated in Britain. It is too well known to need much examination, and is employed both fresh and dried; but is always best decorticated before use, because the cortical portion contains a somewhat acrid matter.

**Composition.**—Contains mucilaginous and a little acrid oily matter, but its chief constituent is a variety of sugar, called *glycyrrhizin*. It is uncrystallisable, yellow, soluble in both water and spirit, and refuses to ferment with yeast. It is incompatible with many metallic salts, as it combines and precipitates with both acids and alkalies,

**Preparation.**—The only preparation is the *extractum* which is prepared from the dried root, because that from the fresh root is liable to go sour; besides it refuses to strain brightly. The ordinary "Spanish" and "Solazzi" of the shops, is extract of liquorice evaporated to a more solid consistency. The Spanish juice is prepared from the same plant as used in pharmacy, but the Italian juice is the product of *G. Echinata*. Extractum Glycyrrhizæ enters into the following :—

Decoct. Aloes Co.
Confect. Sennæ.
Mist. Sennæ Co.
Tinct. Aloes.
Trochisci Opii.

Its use is as a demulcent, to lessen the irritating effects of the other ingredients. It is much used in bronchial and catarrhal affections, by persons following domestic traditions. Powdered liquorice is an excellent excipient for pills, where consistence rather than adhesion is desired. It is so employed in Pil. Ferri Iodidi. Pil., Hydrargyri. Liquorice root is used in Confect. Terebinthinæ., Decoct. Sarsæ Co., and Infus. Lini.

**No. 7.**—(Case B. 42.)—**Irish Moss.**—(Not official.) The entire Alga of Chondrus Crispus—*Algæ*—washed, bleached in the sun, and then dried, chiefly on the west coast of Ireland. The Student should observe carefully

the *elliptical* sori (spore cases) of this thallogen *perfectly sunk* in the thallus, because those of *C. Mamillosus*, for which it is liable to be confused, are *raised* and *spherical*.

**Composition.**—It is said to contain notable traces of Iodine and Bromine, but it is chiefly composed of a vegetable jelly, to which some have applied the special name of *carrageenin*.

**Properties.**—Much vaunted by advertisement, and a common domestic remedy for scrofulous and pulmonary disorders.

**No. 6.**—(Case B. 35.)—**Iceland Moss.** — The entire lichen of Cetraria Islandica.—*Lichenes*. A native of the North of Europe, usually imported from Gottenburgh or Hamburg. Easily known from the Alga just described by its colour and want of sori in a state of fructification. When, however, it is so, it does not possess sori, but flat brown plates, called apothecia, near the edge of the larger pieces.

**Composition.**—Two starches, one the ordinary variety turned blue by iodine, and the other *Innulin*, not so affected. The bitterness of the lichen is due to Cetraric Acid, which exists free in the cortical portion. It is insoluble in water to any marked extent, but soluble in alkalies and in boiling alcohol.

**Properties.**—At once demulcent, nutritious, and a feeble tonic. Given in chronic affections of the stomach, and in pulmonary complaints.

**Preparations.** — Decoctum Cetrariæ, 1 in 20. Dose, 1 to 2 fl. ozs.

**No. 7**—.—(Case .)—**Senega.**—The dried root of Polygala Senega—*Polygalaceæ*. From North America. The

Student should specially notice the distinct line which runs along the whole concave surface of this root, because it forms the distinguishing point of Senega from the roots of *Panax quinquefolium*, *Gillenia trifoliata*, &c., which are its common adulterations.

**Composition**—It contains a volatile fatty acid, pectin, tannic acid, &c., but owes its medicinal properties to *Polygalic Acid*, which exists in the cortical portion, and is volatile, and soluble in water and spirit. When inhaled, it causes irritation of the nose and sneezing. It is a non-nitrogenous body.

**Properties.**—Diuretic, diaphoretic, and stimulant, but in full doses emetic and cathartic. Not much employed, but useful in bronchial affections and whooping cough, as well as in albuminaria, and as an emmenagogue.

**Preparations**:—

| | | | |
|---|---|---|---|
| Infusum. Senegæ, | 1 in 20. | Dose, | 1 to 2 fl. oz. |
| Tinctura ,, | 1 in 8. | ,, | ½ to 2 fl. drs. |

**No. 8.—Elder Flowers.**—The flowers of Sambucus Nigra—*Caprifoliaceæ*. Collected from indigenous plants. The inflorescence of elder is a true cyme, and the flowers are minute, white, and rotate, giving place to globular black berries.

**Composition.**—They owe their activity to their volatile oil, which is yielded by distillation with water.

**Properties.**—A mild stimulant, much used in skin lotions, and as an application to irritable surfaces (discutient.)

**Preparation.**—Aqua Sambuci, 1 in 1.

This water is usually sold in a concentrated form and diluted for use, as the *B.P.* water is apt to grow acid and

cloudy, and lose its odour, doubtless from the quantity of other vegetable products which distil over with the oil.

**No. 9.—Serpentary Root.**—The dried rhizome of Aristolochia Serpentaria. *Aristolochiaceæ.* From the southern parts of North America, requires only to be looked at to be at once familiar.

**Composition.**—A bitter principle, soluble in water and spirit, rendered *brown* by alkalies, but compatible with iron, and also a small quantity of volatile oil.

**Properties.**—Diaphoretic, diuretic, stimulant and tonic. Said to be useful in chronic rheumatism, dyspepsia, low fever, and as a promoter of eruption in the exanthemata. It is useful in certain stages of typhus, and its action in many cases is similar to that of guaiacum, only not so irritating to the bowels.

**Preparations:—**

| | | | |
|---|---|---|---|
| Infusum. Serpentariæ. | 1 in 40. | Dose, | 1 to 2 ozs. |
| Tinctura. ,, | 1 in 8. | ,, | ½ to 2 drs. |

Also contained in Tinct. Cinchon. Co.

**No. 10.** — (Case A. 51.)—**Red Rose Petals.**—The unexpanded petals of the Rosa Gallica—*Rosaceæ.* Cultivated in Britain. The buds are plucked chiefly in the neighbourhood of Mitcham, and the petals having been removed by hand from the calyx, &c., are rapidly dried in a stove. They should be preserved in closed vessels, as by exposure they become worm eaten and mouldy.

**Composition.**—A slight trace of volatile oil, tannic and gallic acids, and a pale reddish colouring matter, extractible both by water and spirit; turned bright *red* by acids, and *green* by alkalies, and entirely *bleached* by sulphuric acid.

**Properties.**—Very slightly astringent and tonic, but chiefly used for colour and flavour. The confection is a valuable excipient for pills, being thus used in 8 pill masses of the *B.P.* The acid infusion is used as a refrigerant drink in fevers, &c., as a vehicle for saline purgatives, and for gargles.

**Preparations**:—

| | | | |
|---|---|---|---|
| Confectio. Rosæ. Gallicæ., | 1 in 4. | Dose, | 30 to 60 grs. |
| Infusum. Rosæ. Acidum., | 1 in 40. | ,, | 1 to 2 ozs. |
| Syrupus ,, | 1 in 17¼ | ,, | 1 to 2 drs. |

**No. 11.—Hops.**—The dried strobiles of the female plant Humulus Lupulus *Cannabinaceæ.* Cultivated in England. The Student will observe the achenes at the base of each bract covered with circular golden yellow glands. It is in these lupulinic glands that the active principle of the hop exists. Examined with a lens, they will be observed to be sessile, and each attached to a common centre at a point called the hilum. When separated from the strobiles by rubbing and sifting, they constitute a yellow powder called *Lupulin.*

**Composition.**—The *Lupulin* of hops contains a volatile oil, a bitter principle called *Lupulite,* a resin, and tannic acid. The volatile oil contains a hydrocarbon, isomeric with turpentine, also *Valerol,* $C_6H_{10}O$, which may be converted into Valerianic Acid by the action of Potassium Hydrate. Lupulite is uncrystallisable, neutral, soluble in water, very slightly soluble in ether, but freely so in alcohol. Lupulin also contains half its weight of a yellow resin, soluble in ether and alcohol.

**Properties.**—Aromatic and tonic, and slightly sedative and soporific, but uncertain in its action in the latter

respect. A pillow of hops is sometimes used to produce quiescence in cases of mania, &c., where opium is inadmissible.

**Preparations**:—

| | | | | |
|---|---|---|---|---|
| Extractum. | Lupuli, | 4 oz. from 1lb. | Dose, | 5 to 10 grs. |
| Infusum. | ,, | 1 in 20 | ,, | 1 to 2 ozs. |
| Tinctura. | ,, | 1 in 8 | ,, | ½ to 2 drs. |

**No. 12.—Worm Seed.**—The unexpanded flower heads of Artemesia Cina—*Compositæ*. Imported from Russia.

**Composition.**—A volatile oil and a glucoside called *santonin*, $C_{15}H_{18}O_3$, scarcely soluble in water, but freely in chloroform, fixed oils, and spirit. Although an apparently neutral body to test paper, it behaves as an acid, and forms *santonates* with alkalies. By exposure to sunlight, it is decomposed into a resinous matter and formic acid.

**Properties.**—A powerful anthelmintic, more especially for the *lumbricus* or round worm. The flowers are seldom administered by themselves, but the santonin extracted from them is given dissolved in castor oil. Santonin is in an overdose an active acrid poison, causing purging and delusions as to the colour of surrounding objects. The dose for a child is ½ a grain twice daily, and for an adult up to six grains.

**No. 13.—Quassia.**—The wood of Picræna excelsa—*Simarubaceæ*. Imported from Jamaica, and generally sold in the form of chips or raspings, which can always be distinguished by their bitterness.

**Composition.**—The active bitter principle is a neutral substance called *Quassin*, which is yielded to both water and alcohol. Quassia contains no tannic or gallic acid, and is therefore devoid of astringency.

**Properties.**—Quassia is a pure bitter, similar in operation, but rather more powerful than Gentian. It is employed in stomach complaints of an atonic or functional character. As it is not affected by Iron or Mercury, it is a useful vehicle for the administration of the salts of those metals. It is fatal to flies and other small insects.

**Preparations:—**

| | | | |
|---|---|---|---|
| Extractum. | Quassiæ, | 1 from 48 (raspings). | Dose, 3 to 5 grs. |
| Infusum. | ,, | 1 in 80 (chips). | ,, 1 to 2 ozs. |
| Tinctura. | ,, | 1 in 27 ,, | ,, 1 to 2 drs. |

**No. 14.—Sassafras.**—The dried root of Sassafras Officinale, *Lauraceæ*. Imported from North America, and usually met with in commerce in the form of chips.

**Composition.**—A resin, *Sassafrin*, and a little tannic acid; but the active principle is the volatile oil.

**Properties.**—Stimulant and diaphoretic, and somewhat sudorific. Never prescribed by itself, but in union with other medicines in skin diseases, rheumatism, and syphilis.

**Preparation.**—Is contained in Decoctum. Sarsæ Co.

**No. 15.—Chiretta.**—The entire plant of the Ophelia Chirata—*Gentianaceæ*. Collected in Northern India, by pulling up the roots when the fruits (capsules) are well formed. The capsules of this plant are worth examining closely, as they are an excellent instance of septicidal dehiscence.

**Composition.**—It yields to water and alcohol a bitter principle analagous to that of Gentian.

**Properties.**—Similar to Gentian, but without a constipating tendency. Very useful in gouty dyspepsia.

**Preparations:—**

Infusum. Chiratæ. 1 in 40. Dose, 1 to 2 ozs.
Tinctura. ,, 1 in 8. ,, ½ to drs.

**No. 16.—Dulcamara.**—The dried young branches of Solanum Dulcamara—*Solanaceæ*—indigenous. This plant, commonly called Woody Nightshade or Bitter Sweet, is to be met with in most hedges. It is known by its auriculate leaves; its extra—axillary cymes; its purple rotate corolla, and its scarlet clusters of small baccate fruits. The filaments of its stamens are scarcely observable, and the anthers cohere in a bright yellow cone, standing out from the corolla.

**Composition.** — An alkaloid called *Solania*, notable from the small proportion of Nitrogen it contains; slightly soluble in water, and coloured *yellow* by Nitric Acid, while Sulphuric Acid produces a series of colours ending in *brown*. It does not dilate the pupil of the eye.

**Properties.**—Not definitely ascertained, but used in lepra, psoriasis, and sometimes as an alterative in syphilis and other conditions of the system, as a substitute for Sarsaparilla.

**Preparation.**—Infusum Dulcamaræ, 1 in 10. Dose, 1 to 2 ozs.

**No. 17.**—(Case B. 7.)—**Savin.**—The dried tops of Juniperus Sabina—*Coniferæ*. Collected in spring, from plants cultivated in Britain. The Student will observe the minute imbricated appressed leaves in rows of four, differing entirely from those of *Juniperus Communis*, with which it should be compared. Under the microscope, the powder exhibits the disc-bearing cells peculiar to Gymnospermia.

**Composition.**—A resin, gallic acid, chlorophyll, &c., but owes its activity to a volatile oil, isomeric with turpentine. *Oleum Sabinæ* is pale-coloured, soluble in ether, but forming a turbid mixture only with spirit. Its specific gravity is ·915, and its dose as an emmenagogue is 1 to 5 minims in an emulsion with mucilage.

**Properties.**—A powerful emmenagogue, causing in an over dose violent vomiting and purging. It is useful in amenorrhœa and chlorosis, but should never be given during pregnancy. Applied to the skin, the oil is rubefacient and vesicant. Powdered savin and verdigris is an excellent application to syphilitic warts. It is sometimes given for criminal purposes.

**Preparation:—**

Tintura Sabinæ, 1 in 8. Dose, 15 to 30 minims.
Unguentum ,, 1 in 3ss.

Should be freshly prepared, as it quickly spoils.

**No. 18.**—(Case A. 5.—**Mezereon.**—The dried bark of Daphne Mezereum, or Daphne Laureola. —*Thymelaceæ.* Indigenous. The first named plant grows wild, but is somewhat rare in England. It is known by its brown stem, its pink sessile flowers in clusters of three on the naked branches, and its lanceolate leaves appearing in fasicles after the flowers. The fruits are scarlet berries. The second named plant is a glabrous evergreen, with axillary racemes of green drooping bracteated flowers and a bluish black berry. Both plants are monochlamydeous.

**Composition.**—A volatile oil, an acrid resin, and a slightly astringent bitter crystalline substance called *Daphnin.* When boiled with water, Mezereon evolves an acrid vapour.

**Properties.**—In small doses, diaphoretic and diuretic. In large doses, emetic and purgative. Externally a powerful local irritant. Only used in this country in combination with Sarsaparilla in scrofulous and syphilitic affections. The ethereal extract is a constituent of Linimentum Sinapis, Co.

**Preparation.** — Extractum Mezerei Æthereum for external use only.

## DRAWER I.

### VARIOUS.

**No. 1.—Balsam of Peru.**—A balsam exuding from the trunk of Myroxylon Pereiræ — *Leguminosæ*. From Salvador in Central America. The bark is beaten till it becomes loose, and is then charred by means of torches. After a lapse of several days, the charred bark falls off and linen rags are applied to the stem which soak up the exuding balsam. When fully saturated, the rags are thrown into a boiler with water, where the balsam separates, sinks to the bottom, and is sent to the market in gourds. The appearance and smell of this substance are so characteristic, that the Student will soon learn to recognise it. Good Balsam should (1) be entirely miscible in 5 parts of rectified spirit; (2) it should not diminish in bulk when shaken with water; (3) 1000 grains should saturate 75 grains of Potassium Carbonate; (4) its specific gravity should range from 1·15 to 1·16.

**Composition.**—It contains a volatile oil, cinnamic acid, and a resin, and is therefore a true balsam. The volatile oil is known to consist schiefly of *cinnamein* $C_{18}H_{16}O_2$ a substance isomeric with Cinnamic Aldehyde (see cinnamon). It is an oily body, insoluble, and heavier than in water,

but soluble in alcohol and ether. The volatile oil constitutes 70 per cent. of good balsam. *Cinnamic Acid*, which amounts, to about 6 per cent. in fresh samples, is doubtless derived from the oxidation of the volatile oil, while the *resin* (23 per cent.) is the product of the action of moisture upon the oil. The longer the Balsam is kept, the more the resin increases in amount.

**Properties.** — Stimulant, expectorant, and slightly tonic. Used in asthma and chronic diseases of mucous membranes. Externally as an application to indolent sores. Dose, to 20 minims in emulsion with mucilage, syrup or yolk of egg ; or in pills, with liquorice powder.

**No. 2.—Balsam of Tolu.**—The balsam exuding from the trunk of Myroxylon Toluifera, *Leguminosæ*, from New Granada. Incisions are made into the bark, from which the balsam runs during the heat of the day. Its smell, &c. are characteristic. It is sometimes mixed with common resin and balsam. If so adulterated, it blackens and evolves sulphurous anhydride when heated with sulphuric acid.

**Composition and Properties.**—Like Peru Balsam, but more readily rendered resinous by keeping. It is an ingredient of *Tinctura Benzoini Co.*

**No. 3.—Storax.**—A balsam obtained from the bark of Liquidambar orientale, *Liquidambaraceæ*. Sent first to Smyrna, and from thence imported *via* Trieste. The outer bark having been removed, the inner bark is then stripped off, and the storax extracted by boiling with water and pressure. It is purified into the official *Styrax præparatus*, by treatment with alcohol and straining.

**Composition.**—It is, like Peru and Tolu balsams, a true balsam, and contains cinnamic acid with a volatile oil, Styracin, and resinous matters. The volatile oil is *Styrol*

$C_8H_8$ having a specific gravity of ·924, boiling at 295°, and soluble in alcohol and ether. *Styracin* remains in the retort after distilling off the styrol, and is insoluble in water, crystallisable, and soluble in alcohol and ether. In common with all substances containing cinnamic acid (see Cinnamon), Storax yields benzoic aldehyde (benzoyl hydride or oil of bitter almonds), by distillation with Potassium bichromate, and sulphuric acid.

**Properties.**—Stimulant, expectorant, like the balsams already considered. It is used in *Tinctura Benzoini Co.*

**No. 4.**—(Case A. 38.)—**Elemi.**—A concrete resinous exudation, probably from Canarium commune, *Amyridaceæ*. Imported from Manilla. It has a very characteristic appearance and odour, and should be nearly soluble in rectified spirit. It becomes hardened by keeping, and is only used in Unguentum Elemi, 1 in 4 of simple ointment, employed for dressing ulcers and issues.

**No. 5.—Kamala.**—A red powder, consisting of the minute glands which cover the capsules of Rottlera tinctoria, *Euphorbiaceæ*. Imported from India.

**Composition.**—Gum, cellulose, albuminous matter, with resins. Some consider the resins as being the active principle, while others believe that a body called *Rottlerin* may be isolated.

**Properties.**—Purgative and anthelmintic for *tænia*. Dose, 30 to 150 grains, followed by castor oil.

**No. 6.—Elaterium.**—The sediment from the juice of the fruit of Ecbalium officinarum, *Cucurbitaceæ*. A native of the South of Europe, and cultivated at Mitcham, &c., in England. The juice is pressed from the cut fruit, strained through a hair sieve, and then set to deposit, and the sedi-

ment is dried on porous tiles. The best is the *English*, and the inferior is the *Maltese*, which will be noticed to be in larger pieces, with scraps of the paper attached, on which the sediment was dried.

**Composition.** — A little resinous, starchy, and extractive matter, and a glucoside called *Elaterin*, $C_{20}H_{28}O_5$, which is extracted by dissolving Elaterium in rectified spirit, filtering, and pouring the concentrated filtrate into warm Liquor Potassæ, when the *Elaterin* separates on cooling in crystals. Elaterium thus treated should not yield less than 20 per cent. of Elaterin.

**Properties.**—Drastic purgative and hydragogue. It is the most powerful purgative known, even more so than Croton Oil. It is used in dropsy, in mania, and to prevent apoplexy; but it is a dangerous drug, requiring great caution in its administration. The persons collecting this drug suffer much from inflammation of the eyes, &c. Its *antidotes* are, warm fomentations, demulent drinks, opium, and blood letting, should inflammatory symptoms run high; followed by stimulants if the circulation fail. The dose is from $\frac{1}{16}$ to $\frac{1}{2}$ a grain, in a pill with Extracts of Henbane and Gentian.

**No. 7.**—(Case A. 47.)—**Indigo.**—A blue pigment, obtained from Indigofera tinctoria and allied plants, *Leguminosæ*. Imported from India. It does not exist already formed in the plant, but is the product of a kind of fermentation. It is partly volatile at 550°, yielding a sublimate, and is insoluble in water and all ordinary solvents. Heated with strong Sulphuric Acid it is dissolved to a blue liquid, called *Sulph-indigotic Acid* (Sulphate of Indigo). Its active principle is *Indigotin*, and its colour is immediately bleached by Chlorine, Hypochlorites, &c. Treated with

reducing agents, such as Ferrous Sulphate, it becomes colourless, owing to the formation of *Indigo white*. Goods intended to be dyed are dipped in this solution, and afterwards exposed to a warm atmosphere, when it becomes reconverted by oxidation, and the goods are thus dyed blue.

**No. 8.**—(Case A. 53.)—**Litmus.**—A blue pigment, chiefly prepared from Roccella tinctori and allied species —*Lichenes*—usually manufactured in Holland from lichens imported from the Canary Islands, &c. Like indigo, it is also a product of fermentation. It is used as a test for acids, with which it changes from *blue* to *red*, the colour being restored by alkalies.

**Preparation.**—Tincture of Litmus, 1 in 10 of Proof Spirit. Used for making Litmus Paper.

**No. 9.**—(Case A. 37.)—**Dragon's Blood.**—A resinous exudation from the Calamus Draco and allied species. Chiefly from the East Indies. It is soluble in alcohol, ether, and oils, and is decomposed by Nitric Acid, yielding Oxalic Acid when the Nitric Acid is strong. It is used as a colouring matter.

**No. 10.—Red Sandal Wood.**—The wood of Pterocarpus santalinus, *Leguminosæ*. From Ceylon. The red colour is extracted by alcohol, ether, and alkalies. It is used as a colouring matter in Tinctura Lavandulæ Co.

**No. 11. — Starch.**—(See definitions.) Commercial starch is usually obtained by a process of washing, from rice, Indian corn, wheat, and other cereals, as well as from potatoes. Several starches are specially prized, such as Arrowroot, which is extracted from the rhizome of Maranta arundinacea—*Marantaceæ*—from Bermuda and St. Vincent, —and Tous les mois, which is extracted from the rhizome of

Canna Ædulis—*Marantaceæ*—from St. Kitts. The starch deposited from the expressed juice of the roots of Manihot Utilissima, *Euphorbiaceæ*, from Bengal, is the well-known Tapioca, and although yielding this delicious article of food, it is a curious fact that the bitter variety of the plant contains in its roots a poisonous juice abounding in Hydrocyanic Acid. Sago is obtained from the interior of the stems of various species of Sagus—*Palmaceæ*—its characteristic form being obtained by making it into a paste with warm water, and forcing it through a sieve. The official *amylum* of the *B.P.* is obtained by a process of washing, from wheat, Triticum Vulgaræ, *Graminaceæ*. The various starches are distinguished from each other by their characteristic appearances under the microscope. They are not soluble in water, but when treated with boiling water the granules swell and form a mucilage, which, when cold, is turned *blue* by Tincture of Iodine. A peculiar variety of starch, called *Inulin*, exists in some plants, which is not affected by Iodine.

**No. 12.**—(Case B. 11.)—**Manna.**—A concrete saccharine exudation, from the stem of the Fraxinus Ornus, and Fraxinus rotundifolia, *Oleaceæ*. Obtained in Sicily and Calabria, by making incisions in the stems of the trees which are cultivated for the purpose. The Student will observe that the best pieces are "flake" manna, which is the only variety official in the *B.P.* Good manna should burn when held in the flame of a candle, should be light and friable, and should scarcely ferment at all with yeast. Artificial manna, which is prepared from Glucose, does not possess these characteristics.

**Composition.**—A little bitter and resinous matter, but the principle part is *Mannite*, $C_6H_{14}O_6$, a white crystalline

body, having a sweet taste, soluble in water and rectified spirit, and not fermentable by yeast. It was formerly considered to be a variety of sugar, but is now known to be a hydrate or alcohol of a hexatomic radical $C_6H_6$.

**Properties.**—A mild laxative, suitable for children, its aperient property being apparently due to the small quantity of extractive and resinous matter that it contains. The dose for children is from 60 to 120 grains, or more.

**No. 13. — Castor.**—The dried preputial follicles and their secretion, obtained from the Beaver, Castor Fiber, *Rodentia*, Mammalia, and separated from the somewhat shorter and smaller oil sacs which are frequently attached to them. From the Hudson's Bay Territory. The Student will observe the form of the follicles and their characteristic odour.

**Composition.**—A volatile oil, containing *Salicin* and Carbolic Acid, a resin soluble in alcohol, and precipitable from its solution by water, and *Castorin*, a fatty crystalline substance, something similar to *Cholesterin*. The active principles of Castor are extracted by alcohol and ether.

**Properties.**—Stimulant and antispasmodic; but rarely administered. Dose in substance, as powder or pill, 5 to 10 grains.

**Preparation.**—Tinctura. Castorei, 1 in 20. Dose, ½ to 1 fluid drachms.

**No. 14.**—(Case A. No. 3.)—**Spigelia.**—Non official.) The root of Spigelia marilandica, *Loganiaceæ*, from the Southern States of North America.

**Composition.**—A volatile and a fixed oil and a bitter principle, soluble in water, the activity of the root being supposed to be due chiefly to the latter.

**Properties.** — Anthelmintic. Administered combined with a suitable purgative, in powder or infusion. Dose, 1 to 2 drachms.

**No. 15.**—(Case B. 33.)—**Saffron.**—The dried stigma and part of the style of Crocus sativus—*Iridaceæ*—a native of Greece and Asia Minor; but imported from Spain, France, and Italy. The best is "hay" saffron, which is styles and stigmas simply dried on paper by the sun or artificial heat. The inferior quality is "cake" saffron. The Student should abserve this article carefully, as it is very subject to adulteration, especially the cake saffron, which is rarely anything else than the florets of Safflower (*Carthamus tinctorius*) pressed together with gum water. Good saffron should not moisten or impart an oily stain when pressed in white blotting paper. Other adulterations of saffron consist in removing a portion of the colouring matter and in mixing it with shreds of dried beef and with the stamens of the plant. These latter are easily recognised by placing a little saffron in water, when their true form becomes apparent.

**Composition.**—Contains a volatile oil and a colouring matter, which differs from other vegetable colourings in becoming *blue* with Strong Sulphuric Acid.

**Properties.**—Slightly stimulant, but generally used simply as a colouring and flavouring matter, in Decoct. Aloes., Pil. Aloes et Myrrhæ., Pulv. Cretæ. Aromat., Tinct. Cinchon. Co., Tinct. Opii. Ammon. and Tinct. Rhei.

**Preparation.**—Tinctura Croci. 1 to 20. Dose, ½ to 2 drachms.

**No. 16.** — (Case A. 44.) **Cloves.**—The dried unexpanded flower buds of Caryophyllus aromaticus, *Myrtaceæ.* Cultivated in Penang, Bencoolen, and Amboyna. The Student will notice the unexpanded *corolla* forming a ball on the top of the tubular four-toothed *calyx*, so as to distinguish true cloves from the fruit of the plant, sometimes imported under the name of "mother cloves." Good cloves should exude oil when pressed with the nail.

**Composition.**—Tannic Acid, resinous and extractive matters, and a volatile oil, which is the active principle. Volatile oil of cloves is composed of a light oil, isomeric with turpentine, and a heavy oil called Eugenic, or Caryophyllic Acid, $C_{10}H_{12}O_2$. The latter acid combines with alkalies to form crystalline salts, which yield a blue with iron salts. It is also reddened by nitric acid, and thus great care must be exercised that it should not be mistaken for Morphia. Recently prepared Oil of Cloves is soluble in alcohol, ether, and oils, and has a specific gravity of 1·034 to 1·055. Dose, from 2 to 5 drops.

**Properties.**—An aromatic and carminative addition to purgatives to relieve griping, &c. Used thus in Confect. Scammonii., Pil. Coloc. Co., and Pil. Coloc. et Hyosc.

**No. 17.**—(Case A. to 33.)—**Bitter Almonds.**—The seeds of Amygdalus communis, variety, Amara, *Rosaceæ.* From Mogadore. The Student will observe that they are smaller in size than the sweet almonds, and evolve, when moistened and rubbed in the hand, an odour resembling Hydrocyanic Acid.

**Composition.**—About 50 per cent. of fixed oil, gummy and saccharine matters, *emulsin* and *Amygdalin.*

(1.) The fixed oil, Oleum Amygdalæ, which is obtained by expression, is slightly yellow in colour, soluble in ether, and in six parts of boiling alcohol. Its specific gravity varies from ·91 to ·92, and it is not so readily solidified by cold, as olive oil. It is demulcent and emollient, and frequently administered in coughs as an emulsion with alkalies and a little tincture of opium.

(2.) Emulsin is a variety of vegetable albumen, soluble in cold water, coagulable by heat, and precipitated from its solutions by alcohol.

(3.) Amygdalin, $C_{20}H_{27}NO_{11}$. A white inodorous glucoside, soluble in water and alcohol, but not so in ether.

Bitter Almonds do not contain any volatile oil, but when treated with water, the emulsin acts upon the amygdalin, and converts it into the well-known Essential Oil of Bitter Almonds, Hydrocyanic Acid and Glucose being formed at the same time.

The *crude* Oil of Bitter Almonds is manufactured from the cake left after the expression of the fixed oil, by macerating it in water for several hours and then distilling. It is a bright *yellow* volatile oil, soluble in alcohol and ether, forming a *red* liquid with strong Sulphuric Acid, which, when poured into water, forms a *yellow* emulsion. It is exceedingly poisonous, from containing sometimes nearly 10 per cent. of the Hydrocyanic Acid which accompanys its formation, as explained above. By agitation with a strong solution of Acid Sodium Sulphite it yields crystals, which, when decomposed with Sodium Carbonate, yield *pure* Oil of Bitter Almonds, which is separated by distillation with Calcium Chloride, to render it anhydrous. This *pure* oil consists entirely of Benzoic Aldehyde (Hy-

dride of Benzoyl, $C_7H_6O$). By exposure to air it absorbs oxygen, producing Benzoic Acid, $C_7H_6O_2$. This change takes place more readily in the *crude* oil, and is the cause of crystals being often observed to separate from long-kept samples.

**Properties.**— Rarely employed in this country for medicinal purposes, but possess similar properties to Hydrocyanic Acid. Their internal use is dangerous, owing to the uncertain amount of this Acid which they yield in contact with water.

**No. 18.**—(Case A. 34.)—**Sweet Almonds.**—The seed of Amygdalus Communis, variety, Dulcis, *Rosaceæ*, from Malaga. The Student will observe that the almond is an exalbuminous seed, with the radicle and plumule situated at the pointed extremity. He will also observe that the Sweet Almond is larger than the Bitter, and does not evolve any odour when moistened and rubbed. The best and only true official Almonds, are Jordan Almonds, from Malaga (A. 34). The next variety are Valencia Almonds, darker in colour, and covered externally with a dusty matter. In addition to these, there are four other varieties known in commerce, named respectively Barbary, Italian, Oporto, and Canary Almonds.

**Composition.**— Sweet Almonds contain a fixed oil, *emulsin*, and gummy and saccharine matters, but do not contain *amygdalin*, and therefore do not yield Hydrocyanic Acid, or essential Oil of Almonds in the presence of water. After steeping in warm water, the *testa* and *endopleura* can be easily removed, leaving the white *cotyledons*, with the *radicle* and *plumule* embedded between them at their apex. This process is called *blanching*, and eight of blanched Almonds pounded with four of white sugar and one of

powdered Acacia, constitutes the Pulvis Amygdalæ Co. of the *B.P.* When this powder is rubbed with distilled water in the proportion of 2½ ounces to a pint, it forms Mistura Amygdalæ, in which the fixed oil is suspended by means of the *emulsin* and *sugar*, so producing a fluid in some respects resembling milk. Great care should be taken that a Bitter Almond be not allowed to get into the mixture, as that would introduce *Amygdalin*, and Hydrocyanic Acid would be formed. The mixture turns sour by keeping and free acid is developed, which coagulates the *emulsin*, and causes an appearance like sour milk. Tinctures, or alcohol in any form, cause the same effect on the mixture. It is, however, unaltered by most neutral saline bodies and by alkalies or their carbonates.

**Properties.**—Mistura Amygdalæ is emollient and demulcent, and used in coughs, or any form of inflammation of the alimentary or urinary systems, or as a medium for the administration of active medicines not possessing an acid reaction.

## DRAWER J.

### CHIEFLY ROOTS.

**No. 1.**—(Case A. 27.) — **Galangal.**—(Non official.)—The dried root of Alpinia Galangal—*Zingiberaeeæ*—from China and America. Used by veterinaries, and possessing similar properties to ginger.

**No. 2.**—(Case A. 25.)—**Ginger.**—The scraped and dried rhizome of Zingiber officinale—*Zingiberaceæ*—cultivated in the West Indies, Africa, &c. The Student will observe (1) Scraped ginger, which has been scraped and washed before drying. The Jamaica ginger is the finest scraped variety. (2) Unscraped ginger, simply washed

and dried, of which the commonest variety is the East Indian (Bengal). There are many qualities intermediate between these two, of which the Student will have heard at lecture. The branched pieces in which ginger usually occurs are called *hands*, or *races*. Good official *races* should be scraped and have a yellowish white, but not a chalky appearance. This latter effect is caused by a process of bleaching, by means of sulphurous anhydride, often performed on bad ginger in this country.

**Composition.**—An acrid resin and a volatile oil (on both of which its activity depends), and also starch. The specific gravity of ginger oil is about ·89.

**Properties.**—Aromatic stimulant and carminative. Given in flatulence, and to allay the griping of purgatives. When chewed, it behaves as a sialagogue. Dose, to 20 grs.

**Preparations**:—

| | | | |
|---|---|---|---|
| Syrupus Zingiberis, | 1 strong Tinct. in 26. | Dose, | 1 to 4 drs. |
| Tinctura ,, | 1 in 8 | ,, | 10 to 30 ms. |
| Tinctura ,, Fort, | 1 in 2 | | 5 to 10 ,, |

Also contained in Conf. Opii, Conf. Scammonii, Inf. Sennæ, Pil. Scillæ Co., Pulv. Cinnam. Co., Pulv. Jalap. Co., Pulv. Opii Co., Pulv. Rhei Co., Pulv. Scammonii Co., Syr. Rhamni, & Vin. Aloes.

**No. 3.**—(Case A. 24.)—**Orris Root.**—(Non official.)—The decorticated and dried rhizome of Iris florentina and allied species—*Iridaceæ*—from Leghorn and Trieste.

**Composition.**—Volatile oil, acrid resin, starch, &c.

**Properties.**—Astringent, acrid, and purgative in large doses, usually only used as a constituent of perfumes and tooth powders, from its odour of violets.

**No. 4.**—(Case A. 22.)—**Birthwort.**—(Non official.)—The dried root of Aristolochia longa—*Aristolochiaceæ*—indigenous, and imported from southern Europe. Not used as a rule by qualified practitioners, but employed as an emmenagogue by certain persons.

**No. 5**—(and A. 17-)—**Long Tumeric.**

**No. 6.**—(  .)—**Round Tumeric.**—The rhizome or tubers of Curcuma longa and Curcuma rotunda—*Zingiberaceæ*—from Bengal and China.

**Composition.** —A yellow colouring matter turning *red* with alkalies and with boracic acid, the latter property serving to detect tumeric, when used as an adulterant of rhubarb, mustard, &c. A tincture of 1 in 6 of rectified spirit is used to colour paper, which, when dried, forms tumeric paper, used to test for alkalies, &c.

**No. 7.**—(Case A. 20.)—**Alkanet.**—(Non official.)—The dried root of Alkana tinctoria—*Boraginaceæ*—imported from France, and only employed as a colouring matter.

**No. 8.**—**Logwood.**—The sliced duramen (heart wood) of Hæmatoxylon Campechianum — *Leguminoseæ* — from Campeachy, Honduras, and Jamaica.

**Composition.**—Volatile oil, resin, tannic acid, and a red colouring matter called *hæmatim*, changed to a lighter tint by acids, and a bluish colour by alkalies. Precipitated as a violet *lake* by alum. This has been proposed as a test for bread, which, if it contains alum, turns bluish with tincture of logwood, but it is not reliable, as tartrates and other substances give a similar effect.

**Properties.**—Mild astringent, and useful in diarrhœa of young persons, in hemorrhages, and as an injection in

leucorrhœa, but its use requires caution, as a continued course has been known to produce phlebitis.

**Preparation:—**

Decoctum hæmatoxyli, 1 in 20. Dose, 1 to 2 ozs.
Extractum ,, ,, 10 to 30 grs.

The extract hardens so much by keeping, that pills made from it are known to defy digestion.

**No. 9.**—(Case B. 20.)—**Squills.**—The sliced and dried bulb of Urgenia Scilla—*Liliaceæ*—from the Mediterranean coasts. The white squills here shown are most esteemed, but another variety is known, in which the outer scales of the bulb are *red.*

**Composition.**—An irritant poisonous principle called *skulein* and a diuretic, and non-poisonous body called *scillitin.*

**Properties.**—Expectorant, emetic, and diuretic, used in chronic pulmonary complaints, whooping cough, and in dropsies when not accompanied by inflammatory symptoms.

**Preparations:—**

| | | |
|---|---|---|
| Acetum Scillæ, | 1 in 8 nearly. | Dose, 15 to 40 minims. |
| Oxymel ,, | | ,, ½ to 1 drachm. |
| Pilula ,, | Co. 1 in 5 | ,, 5 to 10 grains. |
| Syrupus ,, | | ,, ½ to 1 drachm. |
| Tinctura ,, | 1 in 8. | ,, 15 to 30 minims. |

**No. 10.—Colchicum.**—The sliced and dried corm of Colchicum officinale — *Melanthaceæ*—indigenous.—The corm is peeled, sliced transversely, and dried at a heat not exceeding 150°. The activity of the corms is greatest in June, when the leaves have faded. (See Colchicum Seeds, page 11, for Composition and Properties). It enters into

| | | | |
|---|---|---|---|
| Extractum Colchici, | | 4 from 100. | Dose, 1 to 4 grains. |
| ,, | ,, Aceticum, | 5½ from 100. | ,, 1 to 2 grs. |
| Vinum | ,, | 1 in 5. | ,, 10 to 30 ms. |

The acetic extract is best made into pills with liquorice powder.

**No. 11.**—(Case A. 31.)—**Calumba.**—The sliced and dried root of Jateorhiza Calumba, J. Miersii (formerly called Cocculus palmatus) — *Menispermaceæ* — from the forests of Eastern Africa, between Ibo and the Zambesi. The root is a tuberculated one, and the tubercules are collected, sliced transversely, and dried in the shade. It is sometimes adulterated with slices of the root of *Bryonia-diocia, Frasera Walteri,* &c., but the true article is easily known by its characteristic form, by turning deep blue with tincture of Iodine, and by its infusion giving no effect with a Ferric salt.

**Composition.**—Starch, calumbic acid, calumbin, and Berberia. *Calumbin* is a neutral body, and *Berberia* $C_{20}H_{17}NO_4$ is an alkaloid having a yellow colour, and very soluble in alcohol, but precipitable from its alcoholic solution by water, in which it is only slightly soluble.

**Properties.**—Calumba is an aromatic bitter and demulcent tonic, with an entire absence of astringency, and consequently devoid of constipating properties. It is given in indigestion, nausea, and flatulence, usually combined with alkalies, effervescing medicines, or iron preparations.

**Preparations:**—

| | | |
|---|---|---|
| Extractum Calumbæ | 1 from 8. | Dose, 2 to 10 grs. |
| Infusum Calumbæ | 1 in 20 | ,, 1 to 2 ozs. |
| Tinctura Calumbæ | 1 in 8 | ,, ½ to 2 drs. |

**No. 12.**—(Case A. 32.)—**Sumbul.**—The transversely sliced and dried root of Euryangium Sumbul—*Umbelliferæ*—imported from Russia and India. The Russian is the better variety.

**Composition.**—Two balsamic resins, a volatile oil, and sumbulic acid.

**Properties.**—Nervous stimulant and antispasmodic, similar in action to valerian. The resin which seems to be a very active constituent, is sometimes extracted and administered, but the only official preparation is Tinctura Sumbul, 1 in 8. Dose, 10 to 30 minims.

**No. 13.**—(Case A. 26.)—**Male Fern.**—The dried rhizome, with the bases of the foot stalks, and portions of the root fibres of Aspidium Filix mas—*Filices*—collected in summer from indigenous plants. It contains tannic acid, a volatile oil, and a green fixed oil, and is a powerful anthelmintic. Its active properties (oils) are yielded to ether, and the extract so obtained is official as Extractum Filicis liquidum, of which the dose is 15 to 30 minims in emulsion or pill, followed after the lapse of an hour by a sharp dose of castor oil.

**No. 14.—White Hellebore.**—(Not official.) The dried rhizome of Veratrum album, *Melanthaceæ*, from the Alps, Pyrenees, and other mountainous districts of Europe.

**No. 15.—Green Hellebore.**—The dried rhizome of Veratrum viride, *Melanthaceæ*, collected in the autumn in Canada and the United States.

**Composition.**—The composition of both these helleores are similar to *Cevadilla* (which see) their activity being due to gallate of veratia.

**Properties.**—Both varieties are emetic and increase secretions, and in over dose the white is powerfully purgative, while both act on the nervous system and dilate the pupil.

**Preparations.**—Tinctura Verati viridis, 4 to 1 pint. Dose, 5 to 20 minims.

**No. 16.—Black Helebore.**—(Not official.) The dried rhizome and rootlets of Helleborus Niger, *Ranunculaceæ*, from midland and southern Europe. To be carefully observed, as it is frequently contaminated with Actea Spicata, which has, however, a red tinge outside, and a cruciform or triangular meditullium, while true hellebore has a slightly stellate one, and possesses no red tinge.

**Composition.**—An acrid oil and a neutral body called helleborin.

**Properties.** — Drastic and emmenagogue, used in dropsy, nervous diseases, and chronic skin affections. Formerly official in the Pharm. Lond.

**No. 17.—Arnica.**—The dried rhizome and rootlets of Arnica montana, *Compositæ*, from the mountainous parts of middle and southern Europe. In France and America the flowers are employed instead of the rhizome.

**Composition.**— The root contains a volatile oil, an acrid resin, and extractive matter, and the flowers contain in addition an alkaloid called *arnicin*. The most active principle is the resin, and may consequently be extracted by rectified spirit.

**Properties.**—Stimulant, acting on the whole nervous system. It is rarely employed internally, but is a common

external application to sprains and bruises. In an overdose it causes headache, depression of the pulse, vomiting, and purging. Its best *antidotes* are sedatives.

**Preparation.**—Tinctura Arnicæ, 1 in 20. Dose, 2 to 2 drachms.

**No. 18.—Valerian.**—The dried root of Valeriana officinalis, *Valerianaceæ*, collected in autumn, both from wild indigenous plants and from cultivated ones; the former being preferred.

**Composition.**—A resin, extractive matter, *valerianin* and a volatile oil. The volatile oil, which comes over when the root is distilled with water, is a complex mixture of a hydrocarbon isomeric with turpentine, valerol, Valerianic acid, a resin, and a substance analagous to camphor. The two first mentioned are the chief constituents; but in old samples of the oil, much of the valerol is found to have been oxydised into Valerianic acid.

**Properties.**—Antispasmodic and nervine stimulant. Employed in chlorosis, epilepsy, and hysteria.

**Preparations:—**

| | | |
|---|---|---|
| Infusum Valerianæ | - 1 in 40. | Dose, 1 to 2 ozs. |
| Tinctura ,, | 1 in 8. | ,, 1 to 2 drs. |
| ,, ,, Ammoniata, | 1 in 8. | ,, ½ to 1 dr. |

## DRAWER K.

### SUNDRIES.

**No. 1.—Jamaica Sarsaparilla.**—The dried root of Smilax officinalis, *Smilacea*, a native of central America, and imported from Jamaica. The Student will observe the form of the bundle, made up of long reddish brown roots,

furnished with a series of small rootlets known as the beard. When a section is examined by the microscope, it is observed to have a very thick meditullium, and only a very slight deposit of starch in the inner cortical layer. A drop of sulphuric acid will be observed to colour the whole section *dark purple*, and a cooled decoction will *not* become blue with Tincture of Iodine.

**Composition.**—A volatile oil and a white crystallisible body called *Smilacin*, slightly soluble in water, and freely so in alcohol and ether. It does not form salts with acids, and when treated with strong sulphuric acid, it becomes first *reddish*, then *violet*, and lastly *yellow*.

**Properties.**—Alterative. Used in secondary syphilis and all diseases dependent on a depraved state of the system.

**Preparations** :—

| | | | |
|---|---|---|---|
| Decoctum Sarsæ, | 1 in 8. | Dose, | ½ to 1 pint per day. |
| ,, ,, Co. | 1 in 8 | ,, | ,, ,, |
| Extractum ,, liquidum. | 2 in 1. | | 1 to 4 drs. |

**No. 2.—Honduras Sarsaparilla.** — A *non official* variety, probably the produce of Smilax papyracea. It is known in commerce as "gouty" or "mealy" sarsaparilla, and should be carefully compared with the official variety, when its section will be found to present a distinctly starchy layer, which does *not* become violet with sulphuric acid.

**No. 3. — Vera Cruz Sarsaparilla.**—Another non official variety, which the Student should also study to distinguish.

**No. 4.**—(Case A. 10.)—**Broom Tops.**—The dried tops of Sarothamnus Scoparius—*Leguminoseæ*,—indigenous.

**Composition.**—A neutral yellow body called *Scoparin*, $C_{10}H_{11}O_5$, and an alkaloid called *Sparteia*, $C_{15}H_{26}N_2$, the former being considered the diuretic principle.

**Properties.**—Diuretic. Used in dropsy, the action being promoted by diluents.

**Preparations:—**

| | | |
|---|---|---|
| Decoctum. Scoparii, 1 in 20. | Dose, | 2 to 4 ozs. |
| Succus ,, | ,, | 1 to 2 drs. |

Case A. 45.—**Buckthorn Berries.** — The berries of Rhamnus catharticus, *Rhamnaceæ*, indigenous. The expressed juice of the ripe fruit is used in making Syrupus Rhamni. It contains sugar, gum, and a crystallisable body called *rhamnin*.

**Properties.**—Brisk hydragogue purgative. Seldom given, except as a domestic remedy to children.

Case A. 50.—**Cowhage.**—Non official. The hairs of the legum of Mucuna pruriens, *Leguminosæ*, from the West Indies. It is employed as an anthelmintic, acting entirely by mechanically irritating the worms. It is usually given in an electuary with treacle.

Case B. 53.—**Castor Oil Seeds.**—The seeds of Ricinus communis, *Euphorbiaceæ*, imported chiefly from Calcutta. They are used for the expression of castor oil, which is either produced from imported seeds, or more commonly expressed in India and imported from Calcutta. Castor oil which is expressed without the aid of heat, is called "cold drawn" oil. When first produced it is yellowish, but is bleached by exposure to the sun on roofs of houses. Its specific gravity is ·969, and it belongs to the division of fixed oils called drying oils. It is easily soluble in ether, and miscible with twice its volume of rectified spirit.

The four varieties are (1) English oil (cold drawn.) (2) Calcutta oil, prepared by heat. (3) New York oil, also prepared by heat, and (4) Italian oil, a comparatively recent and tasteless variety.

Castor oil is adulterated by mixing it with olive or lard oil, and bringing up the purgative properties by adding a few drops of Croton oil.

**Composition.**—A mixture of Ricin-oleate, Ricin-stearate, and Ricinate of Glyceryl.

**Properties.**—A rapid but mild cathartic, very useful as a purgative for women and children, and in diseases accompanied by inflammatory action in the bowels. Infant dose, 1 to 3 drachms; adult dose, ½ to 1 oz. in an emulsion with yolk of egg or mucilage; the yolk of one egg being sufficient to suspend an ounce of oil.

Case B. 62.—**Caraway Fruit.**—The dried fruit of Carum carui, *Umbelliferæ.* Cultivated in England and Germany. This fruit should be carefully compared with that of Conium, from which it may, however, be readily distinguished by its greater size, its characteristic odour, and by having one vitta in each channel.

**Composition.**—Its active principle is the volatile oil, which has a specific gravity of ·946, and consists of an elæopten isomeric with turpentine, and a stearopten called *Carvol* $C_{10}H_{14}O$.

**Properties.**—Aromatic, stomachic, and carminative. Very useful in flatulence, and to prevent the griping of purgatives.

**Preparation.**—Aqua Carui, 1 in 10. Dose, 1 to 2 ozs.

## ARTICLES NOT IN DRAWERS.

Stoppered Bottle. -- **Copaiba.**—An oleo-resin, flowing from the trunk of Copaifera multijuga. *Leguminosæ*, from the valley of the Amazon. As it is a somewhat expensive drug, it is much subject to adulteration by turpentine, fixed oils, and Gurjun Balsam. The presence of the latter is easily ascertained by the fact that it becomes gelatinous after having been heated to 270°. Turpentine may be detected by its odour on melting, and fixed oils may be deemed to be present, if the copaiba does not dissolve in its own volume of benzol. Good copaiba should also completely dissolve one-fourth of its weight of Magnesium Carbonate by the aid of heat, and remain transparent.

**Composition.**—A volatile oil (40 per cent.) isomeric with turpentine, and holding in solution 52 per cent. of a resin called *Copaivic Acid.* In old samples another resin is found, probably derived from oxydation.

**Properties.**—Acts specially on the mucous membranes of the urinary organs and the rectum. Employed as a specific in gonorrhœa and also in hemorrhoids. Dose, 20 to 60 minims, in emulsion with mucilage or alkalies; or made into pills with an equal weight of Magnesium Carbonate.

The Gurjun Balsam above referred to, is a product of Dipterocarpus turbinatus, and imported from India. It has been lately stated by Dr. Balfour, of Madras, to be a specific for leprosy.

**Herbarium, No. 2.**—*Rosemarinus Officinalis. Labiatæ.* A native of the South of Europe, cultivated in Britain. This plant is an undershrub, with linear leaves, whitish on the under surface and sessile, the margins being entire and revolute. *Calyx* petaloid and bilabiate. *Corolla* monopetalous, irregular, labiate, and of a pale purple colour. *Stamens*, 2. *Style*, two lobed and basilar. *Fruit* of 4 achenes.

**Composition.**—Its active principle is the volatile oil, which is distilled from the flowering tops, and is official as Oleum Rosemarini. It is a mixture of an elæopten isomeric with turpentine, holding in solution a steraopten analagous to camphor. It is colourless, has a specific gravity of ·897 and boils at 365°.

A drachm of oil is yielded by a pound of herb. It is a constituent of Linimentum Saponis., Tinctura Lavandulæ Co., and Spiritus Rosemarini, 1 in 50. Dose, 10 to 50 minims.

**Properties.** — Stimulant and carminative, given in hysteria and nervous complaints. Externally as a stimulant and rubefacient.

**Herbarium, No. 4.**—*Ruta Graveolens. Rutaceæ.* A native of the South of Europe, cultivated in Britain. The plant is an undershrub, with alternate compound tripinnate leaves, with an obovate terminal leaflet. *Calyx*, persistent. *Corolla*, greenish yellow, polypetalous, with unguiculate petals. *Stamens* Hypogenous. *Ovary* superior, and 4 or 5 lobed.

**Composition.**—The active principle is the volatile oil, which is official as Oleum Rutæ, and is distilled from the

fresh herb before flowering. It is pale yellow, and has a specific gravity of ·991. It contains a hydrocarbon isomeric with turpentine, together with Euodic Aldehyde $C_{11}H_{22}O$ and a little Lauric Aldehyde $C_{12}H_{24}O$.

**Properties.**—Antispasmodic and emmenagogue. Used in hysteria, epilepsy, and flatulent colic. Externally it is an acrid stimulant and rubefacient. Dose of the oil, 2 to 6 minims.

**Herbarium, No. 8.** — *Morus Nigra. Moraceæ.* A native of China, cultivated in England.

This plant is a tree with ovate-cordate leaves, unequally lobed. *Flowers* in Catkins, greenish, and monœcious. *Fruit,* anthocarpous and a dark purple sorosis.

**Composition.**—The juice of the ripe fruit, which is official, contains sugar, tartaric acid, and a colouring matter.

**Properties.**—Used only for its colouring and flavouring properties.

**Preparation.**—Syrupus Mori, 1 of juice in 2. Dose, 1 drachm.

**Herbarium, No. 9.**—*Prunus Laurocerasus. Rosaceæ.* A native of Asia Minor. This plant is an evergreen shrub, very common in gardens, with smooth coriaceous shining leaves, oval—lanceolate in shape, slightly serrate and shortly petiolate. *Inflorescence* axillary racemes. *Corolla* rosaceous, white. *Stamens* perigynous. *Fruit* simple and a black drupe resembling a cherry.

**Composition.**—The fresh leaves, which are only official, yield by distillation a volatile oil similar to that of bitter almonds, and like it containing Benzoic Aldehyde and

Hydrocyanic Acid. This oil is probably developed in the leaves by the action of Amygdalin, but the presence of this body has not been definitely proved.

**Properties.**—Sedative and narcotic. Used in heart disease, &c., instead of Hydrocyanic Acid, but its only official preparation Aqua Laurocerasi is very variable in the amount of Hydrocyanic Acid it contains, and is therefore not at all a safe remedy. Dose, 5 to 30 minims.

**Herbarium, No. 15.** — *Lactuca Virosa.* Compositæ. Indigenous. This plant is a biennial herb, with an acrid, milky juice. *Leaves,* oblong, sinuate, mucronate-dentate, slightly auriculate, and furnished with a row of prickles on the keel, or underside of the midrib. *Flowers,* yellow, in capitula, arranged in a panicled manner. The prickles on the keel serve to distinguish this plant from the ordinary garden lettuce (L. Sativa.)

**Composition.**—The active portion is the milky juice, which contains a substance called *Lactucin,* in addition to the usual extractive, resinous, and albuminous matters. When the juice, obtained by incision, is inspissated by exposure to the air, it forms the brownish substance called Lettuce Opium (Lactucarium), which is sometimes used as an anodyne and hypnotic instead of opium, but is uncertain in its action.

**Preparation.**—Extractum Lactucæ. Prepared from the fresh flowering herb. Dose, 5 to 10 grains. 100 lbs. of lettuce yield 5¼ lbs. extract.

In addition to its narcotic properties, the extract is strongly diuretic, as well as slightly diaphoretic and laxative. It is prescribed in dropsy, with squills, digitalis and similar substances.

**Herbarium, No. 19.**—*Prunus domestica.* Rosacæ. Cultivated chiefly in France. This plant is a tree, destitute of spines, and having usually ovate-lanceolate leaves. Its flowers are in axillary cymes, having a white rosaceous corolla, numerous perigynous stamens, and a superior simple ovary producing a drupe, well known as the common black plum. · The official part is the dried dupe, called *Prunum* in the *B.P.* The best prunes are those from Bordeaux, which are dried by alternating the heat of a stove with that of the sun. The composition of prunes is similar to that of many ordinary edible fruits, and embraces sugar, pectin, gummy matter, and malic acid. They are used as a mild laxative especially for children, and as a constituent of *Confectio Sennæ.*

**Herbarium, No. 23.**—*Nicotiana Tabacum.* Atropaceæ. From America (chiefly from Virginia). A somewhat pilose herb with large sessile (and often decurrent) ovate-lanceolate leaves. Inflorescence, a terminal panicle of rose-coloured tubular-infundibuliform flowers. Stamens 5, and ovary superior, two-celled, and producing a two-celled capsule. There are many tobaccos, but the dried and unmanufactured leaves of Virginian tobacco are alone official.

**Composition.**—The active principle is a colourless, liquid, and volatile alkaloid called Nicotia, $C_{10}H_{14}N_2$ with an acrid smell and flavour, becoming thick and coloured on exposure to the air. It is soluble in water, spirit, oils, and most ordinary mentrua, but especially so in ether, which can thus extract it from its solutions. It strikes a port wine colour with strong Sulphuric Acid, a reddish colour with chlorine water, and an orange tint with Nitric Acid. It affects also platinic and mercuric chlorides, and

tannic acid, in a similar manner to many other alkaloids. It is one of the few that we are definitely able to formulate as an *amine*, thus, $\left.\begin{matrix}C_5H_7\\C_5H_7\end{matrix}\right\}N_2$ although in theory we regard all alkaloids as being thus derived from one or more molecules of ammonia by displacement of hydrogen. Nicotia forms deliquescent salts with acids.

**Properties.**—Sedative, narcotic, and emetic, specially acting as a depressant on the heart. It is used only as *Enema Tabaci* (20 grs. in 8 oz. of boiling water, infuse ½ an hour and strain) in cases of obstinate constipation, strangulated hernia, &c., but its employment requires great caution, 30 grains having been known to be fatal. The best antidotes are emetics, stimulants, vegetable astringents and artificial respiration. Tobacco is considered useful in *tetanus*, and consequently it and Strychnia are regarded as mutual antidotes for each other.

**Herbarium, No. 27.**—*Rosa Centifolia.* Rosaceæ. Cultivated in England. This plant is a shrub closely covered with prickles and glandular hairs; leaves, compound, stipulate with ovate leaflets, hairy on the under surface;—Inflorescence axillary in a drooping cluster; calyx divided in a pinnate manner, but not reflexed; cynarrhodum ovate. The petals are stripped off, when the flower is fully developed, and used fresh for distilling the official *Aqua Rosæ.*

**Composition.**—The useful portion is the volatile oil, which distils over with the water, and communicates its delicious fragrance to the *aqua rosæ.* When manufactured in the East, this oil is known as the precious *Attar of Roses*, of which not more than 200 grains at the outside are yielded by 100,000 cabbage roses. It consists of a liquid and a solid oil, and concretes at temperatures below 80°. Its specific gravity when fluid at 90° is ·832.

**Preparations.**—Rose water enters into *Mist. Ferri Co.*, and *Trochisci Bisumthi.* It should be preserved in well stoppered bottles to prevent its going sour, and spirit should not be used to preserve it, because that would render it unsuitable for use in eye lotions, &c.

**Herbarium, No. 60.**—*Rosa Canina.* Rosaceæ—Indigenous. This plant is the common wild or dog rose shrub. It is prickly and has compound impari-pinnate leaves, with adnate stipules. The *calyx segments* are pinnate and deciduous, the *corolla* is rosaceous, and the *fruit* is apocarpous, consisting of a number of achenes, enclosed in a red succulent tube produced by the union of the calyx tube and the thalamus, the whole forming an ovate *cynarrhodum* about an inch long.

**Composition, &c.**—The hips when deprived of their seeds, contain the usual succulent fruit consituents, with both malic and citric acids.

Pounded with twice their weight of refined sugar, they form *Confectio Rosæ Caninæ*, which is in turn used as the excipient in Pilula Quinæ. The achenes are removed because the hairs with which they are surrounded are, like cowhage, exceedingly irritating.

**Herbarium, No. 32.** — *Mentha Viridis.* Labiatæ. Indigenous. This is an erect glabrous herb, with creeping rootstock, ovate-lanceolate sessile and decussate leaves, with serrate margin and powerful odour. The Inflorescence is a spike of verticillasters, and the remaining parts have the characters common to labiate plants.

**Composition, &c.**—It yields, when distilled with water, a volatile oil (*Oleum Menthæ Virdis, B.P.*). 500 parts of flowering herb yield one of this oil, which is pale yellow, darkening

by age and having a specific gravity of ·913. The dose is 2 to 5 minims rubbed with sugar and some water. It is stimulant and carminative.

**Herbarium, No. 33.** — *Mentha Piperita.* Labiatæ. Indigenous. This plant differs from the spearmint just described, in having smaller and darker leaves, ovate-oblong in shape, and in possessing a different odour.

**Composition, &c.**—It yields by distillation the volatile *Oleum Menthæ Piperitæ* B.P., of which the greatest yield is three fluid drachms from two pounds of the fresh flowering herb. Usually at Mitcham, at Mr. Bridger's distillery (where some of the finest oil is made), the yield is about a ½ per cent. The fine oil is nearly colourless, has a specific gravity of ·902, and consists of an elæopten isomeric with turpentine, and a stearopten called peppermint camphor, $C_{10}H_{20}O$. When treated with Zincic Chloride, this camphor yields a volatile liquid hydrocarbon called Menthene, $C_{10}H_{18}$. The oil of peppermint is stimulant, carminative and antispasmodic. Given in flatulence and also to relieve griping and conceal the taste of nauseous drugs. It enters into *Pil. Rhei Co.* as well as

| | | | |
|---|---|---|---|
| Aquæ Menthæ Pip. | 1 in 853. | Dose 1 to 2 ozs. | |
| Essentia ,, ,, | 1 in 5. | ,, 10 to 20 mins. | |
| Spiritus ,, ,, | 1 in 50. | ,, 30 to 60 ,, | |

**Herbarium, No. 44.**—*Cochlearia Armoracia.*—Cruciferæ. Cultivated in, but not indigenous to, Britain. A perennial herb, with large, sessile, oblong or lanceolate leaves. Inflorescence racemose, and with bracts.—Corolla cruciform, white—Stamens 6 tetradynamous—Ovary superior, and fruit an oval *silicula.* The root is very long, white, and cylindrical, and must be carefully distinguished from Aconite (see page 71).

**Composition, &c.**—Yields a volatile oil identical with that of black Mustard, and produced in the same manner (see page 78). The properties are similar to those of Mustard, and its only preparation is *Spiritus Armoraciæ Co.* 1 in 8, dose 1 to 3 drachms, which is used in atonic dyspesia and as an adjunct to diuretic infusions.

**Herbarium, No. 46.**—*Papaver Rhœas.*—Papaveraceæ. Indigenous. This is an annual herb with simple pinnatisected leaves, and pilose flower stalks. The *calyx* is deciduous, and is consequently only seen in the bud, while the *corolla*, is polypetalous and consists of 4 magnificent dark red petals, with a black spot at the base. *Stamens* numerous and hypogynous, and *ovary* superior, with a sessile stellate stigma, and parietal placentas. Fruit a capsule.

**Composition, &c.** — The fresh petals are used for making Syrupus Rhæados, owing to their containing about 40 per cent. of red colouring matter. The syrup is only used for tinctorial purposes, and is blackened by alkalies, while an imitation syrup from red cabbage would be turned green by liq. potassæ. The specific gravity of Syrupus Rhæados should be 1·33.

**Herbarium, No. 48.**—*Lavandula vera.*—Labiatæ. A native of southern Europe, cultivated at Mitcham, &c., in England. The plant is an undershrub, with linear-lanceolate leaves, having entire and revolute margins. Inflorescence in spikes of somewhat scattered verticillasters, with greyish purple labiate flowers, possessing a characteristic odour. The stamens are 4 didynamous, the style basilar, and the fruit of 4 achenes.

**Composition, &c.**—The flowers when distilled with water, yield the official Oleum Lavandulæ, which is a pale coloured, fragrant, volatile oil, having a specific gravity of from ·877 to ·905. The finest Mitcham oil is obtained by distilling the flowers and stalks, and collecting apart the first portions of the oil which come over, the remainder being taken for second quality.

Oil of Lavender is used as a perfume in lotions and liniments, and when taken internally, it is stomachic and stimulant, and useful in headache, hysteria, flatulence, lowness of spirits, fainting, &c.

**Preparations.**—The oil is used in Linimentum Camphoræ, and in

Spiritus Lavandulæ, 1 in 50. Dose, 30 to 60 minims.

Tinct. Lavand, Co. 45 minims in 1 pint. Dose, ½ to 2 drs.

The tincture is used in making Liquor Arsenicalis.

**Herbarium, No. 105.**—*Mentha Pulegium.* Labiatæ. Indigenous. It is known from other mints by its being short, much branched, and having small ovate and petiolate leaves. The verticillasters are also much farther apart and the calyx is decidedly hispid.

**Composition, &c.**—Pennyroyal yields a volatile oil, which, in addition to the properties of those from other mints, possesses an emmenagogue tendency, and is so used among country people. It is not official.

**Herbarium, No. 55.**—*Vitis Vinifera.* Vitaceæ. Cultivated in the milder parts of Europe. It is a climbing shrub, with sinuate-dentate lobed leaves (many of the larger ones almost palmate) and having a spiral tendril arising opposite each leaf. The infloresence is a close

variety of panicle called a *thyrsus*. The fruit is in structure like a berry, but superior, and called a *nuculanium*. When grapes are pressed, they yield a juice, which, on fermentation, produces wine; and when dried in the sun or by heat, they form raisins, which, if produced and manufactured in Spain, are official as Uvæ, *B.P.*

**Composition, &c.** — Grapes contain grape sugar, $C_6H_{14}O_7$, and also tartaric acid, which latter is deposited from the wine, during fermentation, in the form of Potassium Acid Tartrate, commonly called Argol, or Cream of Tartar. The deposition takes place owing to the slight solubility of the salt in water, and its almost total insolubility in the presence of spirit. Cream of Tartar $KHC_4H_4O_6$ is the source of tartaric acid and all tartrates. Raisins are demulcent, and are contained in Tinct. Cardam. Co. and Tinct. Sennæ. *Tartaric Acid* $H_2C_4H_4O_6$ is prepared from cream of tartar, by a long process, for which the Student is referred to the *B.P.* It is distinguished from Citric Acid by giving a precipitate of cream of tartar when shaken up with potassium acetate. It is not much used in medicine, except as a constituent of *sodæ citro-tartras effervescens*, but is a cheap substitute for citric acid, being, however, more apt to act as an irritant on the bowels. Twenty grains of Acid. Tart. neutralize

| | | |
|---|---|---|
| 15½ | grains. | Ammon. Carb. |
| 22 | ,, | Sodæ Bicarb. |
| 27 | ,, | Potassæ Bicarb. |

In mixing this acid with Potassæ bicarb, the former should always be added to the latter, as so long as the potash is in slight excess, no precipitate of cream of tartar will be formed.

**Herbarium, No. 87.**—*Lycopodium Clavatum*, Lycopodiaceæ. Common in the northern parts of Britain. This acrogen has a creeping stem, with small imbricated linear leaves. The fructification in spikes, consisting of sporangia filled with a yellow powder (spores). This powder is used as an application in erysipelas and scalds, owing to its highly absorbent nature. It contains a little fixed oil, sugar, and mucilage; but the chief part is a substance insoluble in all ordinary menstrua. Lycopodium powder is sometimes used as a coating for very moist pills, or where starch is undesirable.

Jar, No. 1.—**Oleum Theobromæ.**—A concrete oil, obtained by heat and expression from the crushed seeds of *Theobroma Cacao.* Byttneriaceæ. From Mexico. The beans yield about 50 per cent. of fat.

**Composition, &c.**—It is principally Stearate of Glyceryl, with a little Oleate. It should be nearly white, and melts at 120° Fahr. It is used in making the chief suppositories of the *B.P.*

Jar, No. 2.—**Adeps Præparatus.**—The prepared internal abdominal fat of the hog.—*Sus scrofa.*—Pachydermata (thick skinned) Mammalia. The fat is first washed with water, then melted at 212°, strained through flannel, and stirred at a temperature a little above 212°, till all the water is evaporated.

**Composition.**—Lard melts about 100°, and consists of 60 per cent. Oleate of Glyceryl, with some Palmitate and Stearate. Distilled water, which has been boiled with it, should not be precipitated by Argentic Nitrate (absence of salt), and should not become blue with tincture of Iodine (absence of starch.)

**Preparations.**—Adeps Benzoatus, 1 of Benzoin and 45 of lard. Ungentum Simplex, 3 of lard, with 2 of white wax, and 3 of almond oil.

Jar, No. 3.—**Mel Depuratum.**—A saccharine secretion deposited in the honeycomb by the *Apis Mellafica.* Hymenoptera, Insecta. The honey is melted in a water bath, and strained while hot, through a flannel moistened with warm water.

**Composition, &c.**—It consists chiefly of grape sugar, $C_6H_{14}O_7$, and is similar in action to common sugar, but more laxative. Eight of clarified honey, 1 of acetic acid, and 1 of distilled water, constitute Oxymel, *B.P.*, used as a vehicle for gargles and cough mixtures.

Clarified honey also enters into mel boracis, oxymel scillæ, confectio piperis, confectio scammonii and confectio terebinthinæ.

Jar, No. 4.—**Sevum Præparatum.**—The prepared internal abdominal fat, purified by melting and straining, of the sheep—Ovis Aries.—Ruminantia.—Mammalia.

**Composition, &c.**—Purified suet is fusible at 103°. It consists chiefly of Stearate of Glyceryl $C_3H_53C_{18}H_{35}O_2$. By saponification with alkalies, it yields a stearate of the alkali employed and free glycerine. Its properties are emollient, and it is employed in making Unguentum Hydrargyri, Emplastrum Cantharidis, and generally where a firmer consistence is required than can be obtained by the use of lard.

Stoppered Bottle, No. 2.—**Moschus.**—The inspissated and dried secretion from the preputial follicles of *Moschus moschiferus.*—Ruminantia.—Mammalia. A native of Thibet, and imported from India and China.

The two chief varieties of musk are Chinese and Russian, the Russian follicles being larger, and containing nearly 200 grains of musk in each sac, whilst the Chinese, which are usually of finer quality, contain about 160 grains.

**Composition, &c.**—It contains fatty matters, Cholesterin, Ammonia, and a volatile oil. The odoriferous principles are soluble in ether and alcohol, and when treated with potash, an increase of the odour takes place, accompanied by the evolution of ammonia. Owing to its high price it is much adulterated, and the microscopical characters should, therefore, be carefully noted, so as to enable the purchaser to distinguish dried blood, liver, ground coffee, &c. The hairs on the true sacs are arranged in a circular manner round the orifice. The properties of musk are stimulant and antispasmodic, generally resembling those of Castor.

Bottle, No. 3.—**Oleum Morrhuæ.**—The oil extracted from fresh liver of Cod, *Gadus Morrhua*—Pisces. Prepared in England and Newfoundland.

**Composition.**—The specific gravity of pale cod liver oil is about ·92. It contains chiefly oleate of glyceryl, with traces of iodine, bromine, and propylamine. Upon saponification, cod liver oil yields *propyline*, and when treated with strong sulphuric acid, it developes a beautiful crimson colour, which is supposed to be an evidence of its containing certain biliary principles. A substance called *gaduin* has been isolated, which is very similar to one of the acids of bile. According to Pettenkofer, the colour with sulphuric acid is due to the presence of cholic acid.

**Properties.**—Used in phthisis, and in scrofulous and mesenteric diseases.

Bottles, No. 4, &c.—**Various Specimens of Isinglass**—The sound or swimming bladder of various species of Acipenser, Pisces. Chiefly from Russia.

**Composition.**—Contains 98 per cent. of gelatine, and is employed as a dietetic in the form of jellies for invalids. Its solution, mixed with tincture of benzoin, and brushed over black sarcenet, forms Court Plaister. A solution of gelatine is official for distinguishing tannic from gallic acid, yielding a precipitate with the former, but not with the latter.

Bottles, Nos. 10 and 11.—**Hirudines.**

No. 10.—*Sanguisuga medicinalis* (speckled leech). No. 11, *Sanguisuga officinalis* (green leech). Annulosa. Collected in Spain, France, Italy, and Hungary.

The Student will notice the body to be formed with a disc at each end, the posterior disc having a thick rim, with the upper lip prominent. The mouth is furnished with three cartilaginous jaws, each possessing a double row of pointed teeth. When the leech is applied, it first fixes its disc, or sucker on the part, and then causes, punctures by a sawing motion of the teeth, which remain fixed in the wound. The blood is extracted by suction, the animal continuing to swallow it until it has entirely filled itself, when it drops off.

The two varieties of leech are easily recognised by the belly, which, in the case of the speckled leech, is greenish yellow, spotted with black, while that of the green leech is olive green, and not spotted. The average amount of blood extracted by a leech is a drachm and a half, and the bleeding is best stopped by pressure or collodion, or in extreme cases, by a cautery.

Leeches are usually applied as a substitute for blood letting, in inflammations, hemorrhoids, &c., and generally where the sudden effect of blood letting is unnecessary.

**Gossypium.**—The hairs of the seed of various species of *Gossypium*—Malvaceæ. Prepared by carding. The plant bears capsules, which open in a loculicidal manner, and contain numerous seeds, entirely surrounded by hairs. It is cultivated in most tropical regions, but especially in the United States of America.

**Composition.**—It is pure *cellulin* $C_6H_{10}O_5$, and insoluble in all menstrua, except strong mineral acids and alkalies. It is used as an application to inflamed surfaces, such as burns, &c. When treated with a mixture of strong nitric and sulphuric acids, and afterwards washed, it yields *Pyroxylin* (Gun Cotton). If the *B.P.* proportions of acid be followed, the pyroxylin produced is dinitrocellulin $C_6H_8\ (NO_2)_2\ O_5$, that is cellulin, in which two of the hydrogens have been displaced by the monad radical Nitryl. When dissolved in a mixture of alcohol and ether, it forms *collodium, B.P.* which is used as an adhesive in burns and excoriations, to stop bleeding and to coat pills, on account of the readiness with which it dries up, leaving a delicate film impervious to air, and insoluble in water. Six fluid ounces of collodion, with a drachm of castor oil, and 120 grains of Canada balsam, produce *Collodium flexile.*

Bottle, No. 12.—**Oleum Cajuputi.**—A volatile oil of a green colour and a powerful odour, distilled from the leaves of *Melaleuca Minor*—Myrtaceæ,—growing in the Molucca Islands, and imported from Batavia and Singapore. Its specific gravity is ·914 to ·925, and it consists chiefly of a hydrated terpene, $C_{10}H_{18}O$, (sometimes called hydrate of cajuputene), with some green organic colouring matter. Notable traces of copper have been found in

many samples. It is used as both an internal and topical stimulant in hysteria and flatulent colic, and it also possesses antispasmodic and diaphoretic properties.

Mixed with olive oil, it is used as a liniment in gout and chronic rheumatism. It is contained in Linimentum Crotonis, and also in Spiritus Cajuputi, 1 in 50, Dose, ½ to 1 fluid drachm or more. A false oil of Cajeput has been detected, which is prepared by dissolving camphor in oil of rosemary, and colouring the mixture with copper.

## Explanations of Therapeutical Terms, with a few Examples.

**Alteratives.**—Under this class, are included all drugs which cause certain useful changes in the system, but the nature of which is not sufficiently well understood for further explanation. Examples, Preparations of Mercury, Iodine, Arsenic, Chlorine, Sulphur, together with Sarsaparilla, Taraxacum, Dulcamara, &c.

**Antidotes** are substances which have the special power of preventing the action of certain poisons. The examples will be found already referred to throughout the book, under each poison.

**Antispasmodics** act on the spinal cord, and so allay spasmodic affections. Examples, assafœtida, valerian, camphor, oils of rue, cajeput, &c.; liquor ammoniæ and ammonium carbonate, bromides, conium, hydrocyanic acid, opium, hyoscyamous, (and the other poisonous atropaceæ) cannabis, chloroform, &c.

**Antacids** are alkaline remedies, which act by checking acidity in all the secretions. All the hydrates or carbonates of potassium, sodium, lithium, magnesium, or calcium, and also all organic salts of alkalies, such as citrates, which become alkaline in the passage through the system.

**Anthelmintics** are divided into two classes.

(1) *Vermicides*, which act directly by killing worms in the intestines. Examples, male fern, turpentine, kamala, kusso, pomegranate, and santonica.

(2) *Vermifuges*, which cause the expulsion of worms, but not necessarily dead. Examples, jalap, scammony, castor oil, gamboge, &c.

After the worms have been expelled, their recurrence may be prevented by salts of iron, quassia, &c.

**Antiperiodics** possess the power of delaying the return of the paroxysms, and thus finally arresting intermittent diseases. Example, cinchona barks and their alkaloids, arsenical preparations, and possibly Berberia.

**Antiseptics** are substances which arrest putrefaction. Examples, carbolic acid, creosote, sulphurous acids, chlorides of zinc, sodium and aluminium.

**Astringents** are substances which cause contraction of the blood vessels, and consequently a greater tendency to coagulation in that fluid, and a lessening of all the secretions. Examples, all substances containing tannic or gallic acids, the vegetable and mineral acids, alum, zinc, plumbic and ferric salts, matico, &c.

**Diaphoretics** are substances which increase the secretion from the skin. Examples, sweet spirits of nitre, citrate and carbonate of ammonium, guaiacum, opium, ipecacuanha, and tartar emetic.

**Disinfectants** are substances which oxidise and utterly destroy putrefying matters, and so entirely remove the source of contamination. Examples, permanganates, the new compound called "chlorozone," chlorine, and chlorinated compounds, &c.

**Diuretics** are substances which act upon the kidneys and increase the flow of urine. Examples, sweet spirits of nitre, squills, scoparium, colchicum.

**Ecbolics** are substances which excite contractions of the uterus, and consequently the expulsion of the fœtus. Examples, ergot, savin, borax, and digitalis.

**Emmenagogues** are substances possessing the power of exciting menstruation. Examples, assafœtida, rue, aloes, colocynth, and preparations of iron.

**Emetics** are substances which so invert the action of the æsophagus and stomach, as to cause a sudden rejection of their contents. Examples, sulphates of zinc and copper, mustard, tartar emetic, and ipecacuanha.

**Emollients** are substances which diminish irritation by softening the skin. Examples, starches, honey, fixed oils, fats, and glycerine.

**Errhines** are substances which cause a sudden secretion from the mucous membrane of the nose, and so produce sneezing. Examples, veratria, tobacco, &c.

**Escharotics** are substances which disorganise the skin, forming a wound covered by an eschar. Examples, nitrate of silver, sulphate of copper, chloride of zinc, the strong mineral acids, and caustic alkalies.

**Exhilarants** act upon the brain, and cause general excitement and increased activity in all bodily functions. Example, all alcoholic beverages, cannabis and opium (in small doses).

**Expectorants** are substances which cause the throwing off of mucous from the pulmonary system, and also act as alteratives in the mucous itself. Examples, squills, senega, the true balsams, benzoic acid, ipecacuanha, the fœtid gum-resins, tartar emetic in small doses, &c.

**Irritants** are of three classes.

(1) *Rubefacients*, causing merely irritation and reddening of the skin. Examples, mustard, turpentine, mezereon, iodine and the iodides of lead and cadmium, linimentum camphoræ co. (2) *Vesicants* or *Epispastics*, which cause the effusion of fluid under the cuticle, and the consequent raising of a blister. Examples, cantharides, and glacial acetic acid. (3) *Pustulants*, which so irritate the skin, that a formation of matter takes place. Examples, croton oil and nitrate of silver.

**Lithontriptics** are medicines which prevent the formation of urinary deposits and calculi, by altering the urine. Examples, alkalies, alkaline mineral waters, benzoic, citric and phosphoric acids.

**Mydriatics** are substances which dilate the pupil of the eye. Examples, atropia, belladonna, hyoscyamus and stramonium.

**Myositics** are substances which contract the pupil of the eye. Examples, physostigmatis, opium.

**Narcotics** act upon the brain, and are divided into

(1) *Anodynes*, or pain alleviators. Examples, the poisonous atropaceæ.

(2) *Soporifics*, or sleep producers (which also always possess the anodyne property). Examples, opium and its preparations, potassium bromide, lactuca, &c.

**Purgatives** are of six classes.

(1) *Laxatives*, which simply cause increase of the peristaltic movements, and a slight softening of the fœcal matter discharged. Examples, prunes, manna, castor oil, magnesia and its carbonate, &c.

(2) *Purgatives*, which increase the peristaltic action, and are used to obtain a complete emptying of the bowels without irritation of the mucous membrane. Examples, rhubarb, sennæ, aloes, &c.

(3) *Drastic Purgatives*, more powerful in their action than simple purgatives, irritating to the mucous membrane, and causing some elimination of fluid. Examples, jalap, scammony, colocynth and croton oil.

(4) *Hydragogue Purgatives*, possessing the additional property of causing a great elimination of fluid, and giving relief by emptying the portal system. Examples, elaterium, potassium bitartrate and gamboge.

(5) *Saline Purgatives*, producing copious watery stools without drastic irritation, but with a slight hydragogue action. Examples, sulphates and phosphates of the alkalies, sulphate of magnesia, and Rochelle salts.

(6) *Cholagogue Purgatives*, which act also upon the liver and gall bladder, causing a discharge of bile into the intestines. Examples, mercury, podophyllum and aloes.

**Refrigerants** are substances administered in fevers to cool the body. Examples, citric and tartaric acids, or fruit juices containing them, vinegar, nitrate of potash, &c.

**Sedatives** are of four varieties.

(1) *Spinal Sedatives*, which act on the nervous system, by lessening the functions of the spinal cord, Examples, conium, hydrocyanic acid, physostigmatis and bromides. (2) *Vascular Sedatives*, which lessen the action of the heart, and through it that of the whole circulatory system. Examples, veratria, digitalis, aconite, hydrocyanic acid, colchicum, preparations of antimony, ipecacuanha and tobacco. (3) *Stomachic Sedatives*, possessing a sedative action upon the mucous membrane of the stomach. Examples, the fixed alkaline liquors and bicarbonates, salts of bismuth, cerium, hyoscyamus, opium and hydrocyanic acid. (4) *Pulmonary Sedatives*, which act on the respiratory organs, diminishing the secretion of the bronchial tubes.

Examples, opium and the vapours of tobacco, conium, stramonium and hydrocyanic acid.

**Sialagogues** are substances which excite the flow of saliva. Examples, pyrethrum, armoracia, mercurials in excess, and iodides.

**Styptics** are substances applied to stop hemorrhage. Examples, astringents containing tannic acid, alum, salts of lead, iron and zinc.

**Stimulants** are of three varieties.

(1) *Spinal Stimulants*, which act specially by increasing the functions of the spinal cord. Examples, nux vomica and its alkaloids, phosphorous, cantharides, &c. (2) *Vascular Stimulants*, which act on the whole circulatory system and on the heart, causing increase in its action. Examples, ammonia, alcohol, assafœtida, valerian, guaiacum, mezeron, &c. (3) *Carminatives*, which act by stimulating the mucous membrane of the stomach, allaying pain, and especially flatulence, both in it and the intestines. Examples, pepper, ginger, cardamoms, mustard, oils of peppermint, anise, and other umbelliferous volatile oils.

**Tonics** are of three kinds :—*Blood Tonics*, which restore the blood to a healthy state by supplying some constituent in which it has become deficient. Examples iron and cod liver oil. (2) *Stomachic Tonics*, which improve the appetite and digestion by direct action on the stomach. Examples, gentian, chiretta, quassia, calumba, dilute mineral acids, pepsin. (3) *Nervine Tonics*, which give an improved tone to the whole nervous system. Examples, nux vomica, cusparia. (4) *Vascular Tonics*, which strengthen the whole system of circulation, together with the heart. Examples, digitalis, and by indirect action, all tonics.

# INDEX.

Noon & Lucas, Printers, 152, Lower Kennington Lane, London.

CHLOROZONE disinfects by Oxygen and Chlorine Gas.—The Chlorzone referred to in the *Times*, July 11th, and recommended by Dr. Donnett Stone as the best disinfectant, can be obtained of all chemists by order.

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CHLOROZONE.—Dr. Harry M. Noad. Ph. D., F.R.S., of St. George's Hospital, says of Chlorozone: "It is superior to Condy's Fluid, both as a deodoriser and disinfectant, its action being longer sustained."

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CHLOROZONE is the publicly acknowledged best disinfectant and deodoriser invented, consisting of naseent oxygen and chlorine gas; these when set free speedily destroy the organic germs which are brought within the sphere of their operations. Chlorozone should be used in every household, in every sleeping apartment.

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CHLOROZONE, The Great Oxygenating Agent.—Dr. E. D. Mapother, M.D., Medical Officer of Health and Surgeon to St. Vincent's Hospital, Dublin, says of Chlorozone:—"After several experiments, I find that it freely gives off Chlorine and some of its compounds, which are the best deodorisers and disinfectors of air, and it is therefore more generally applicable than Carbolic Acid. When placed in contact with organic matter it has high oxidising power, and it is therefore a reliable disinfectant of sewage."

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CHLOROZONE.—Dr. A. Ernest Sansom, M.D., Physician to the Royal Hospital for Diseases of the Chest, and Vice-President of the Medical Society of London, says of Chlorozone:—"I have no hesitation in saying that it is the best agent I have met with for deodorisation, and for destruction by oxidation of the various products of putrefaction."

CHLOROZONE, the best Disinfectant and Deodorant.—Dr. Charles A. Cameron, Professor of Hygiene, Royal College of Surgeons, Analyst to the City of Dublin, Author of "A Treatise on Disinfectants," says of Chlorozone:—"I have formed a most favourable opinion relative to the sanitary uses of that article. It is not a poisenous substance, like carbolic acid. Chlorozone is an admirable deodorant and disinfectant for household purposes."

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CHLOROZONE, now used daily in the Court of Queen's Bench during the Tichborne Trial, by desire of Lord Chief Justice Cockburn.

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CHLOROZONE.—THE BEST.—"Chlorozone has been patented; and is described in the specification as 'A mixture of alkaline permanganate with alkaline hypochlorite and chloride;' and we find by analysis that the description is accurate. The new agent emits chlorine slowly in its natural state, and is, therefore, it may be presumed a little more active than the permanganates."—From the *Lancet*, 9th August, 1873.

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CHLOROZONE is recommended (on its merits) and used by the most eminent medical men in England and Ireland, and is acknowledged publicly the most perfectly successful invention to prevent the spreading of fevers, cholera, small-pox, &c.

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CHLOROZONE.—Dr. Rugg, M.D., L.R.C.P., M.R.C.S., says, I have used Chlorozone as a spray both fo rinhalation and for dispersion throughout the room in cases of whooping cough and fever with marvellous success."

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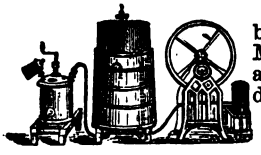

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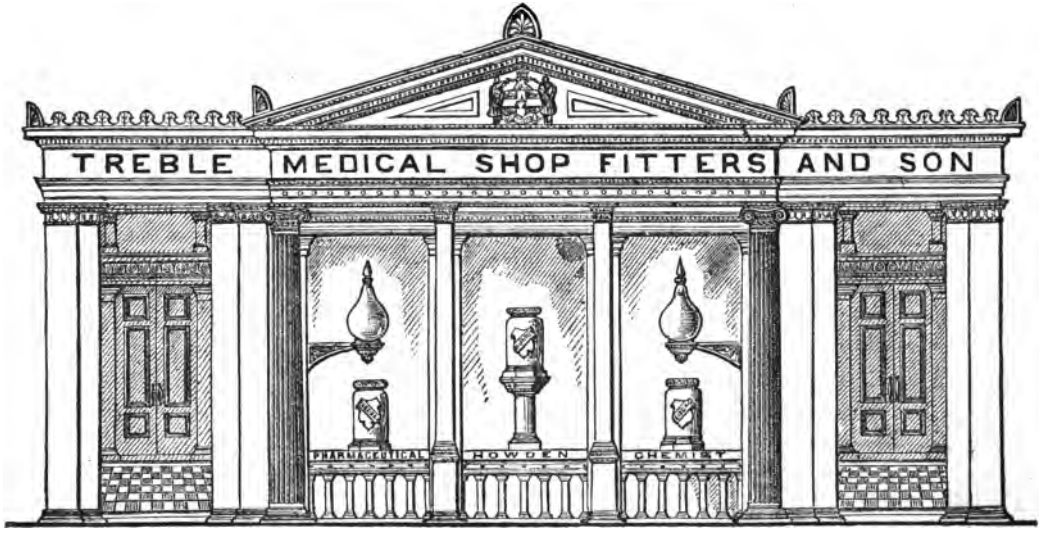


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